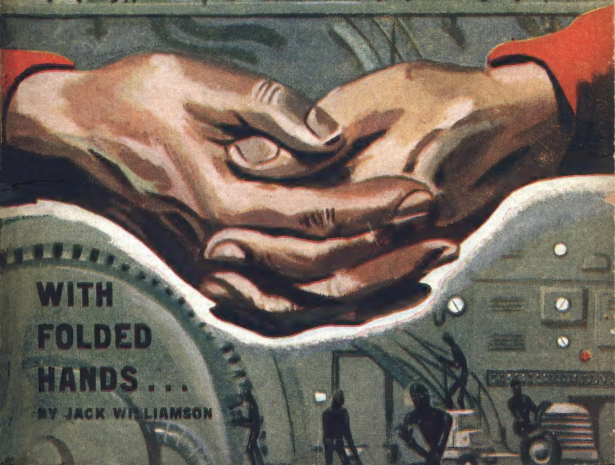


A STREET & SMITH PUBLICATION

# *Astounding* **SCIENCE FICTION**

BRITISH  
EDITION  
9<sup>D</sup>

FEBRUARY



**WITH  
FOLDED  
HANDS...**

BY JACK WILLIAMSON

# Lend Me Your Body for 7 Days...

and I'll Give You PROOF  
I Can Make YOU  
a NEW MAN!

— Charles Atlas

PUPIL'S 7-INCH CHEST  
EXPANSION AMAZES  
R.A.F. DOCTOR

"I was passed grade one by an R.A.F. Medical Board on Tuesday. The Doctor who measured my chest said it was the best expansion he had seen for a long time, and he examined fifty every day. From right down to fully expanded the expansion was 7 inches. I am developing my body beautifully now and shall always be grateful to you." Your pupil,  
—D. R. P. (Glam.)

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Has Ever Dared Make Such An Offer!

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"The  
World's Most  
Perfectly De-  
veloped Man."

These Secrets Have Helped Thousands

Write your name and address carefully on the coupon below. I'll send you a copy of my new book, *Everlasting Health and Strength*. It reveals the secrets that changed me from a 7-stone flat-chested weakling into a husky fellow who twice won the title of "The World's Most Perfectly Developed Man" against all comers! And it shows how I can build you into an *Atlas Champion* the same way.

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APPARATUS

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Get my book, *Everlasting Health and Strength*. Post my coupon to-day. Gamble a stamp to prove I can make YOU a new man!

Send for

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It tells you all about my *Dynamic Tension* method, and how it has made big muscled men out of run-down specimens. It shows you from actual photos, how I have developed my pupils to the same perfectly balanced proportions of my own physique. What my system did for me and hundreds of others it can do for you too. Don't keep on being only half the man you CAN be! Find out what I can do for you.

NOTE:

This is the latest photo of Charles Atlas. This is not a studio picture but an actual unretouched snap-shot.

Where shall I send your copy of "*Everlasting Health and Strength*"? Post the coupon TO-DAY to CHARLES ATLAS (Dept. 125-A), 2 Dean Street, London, W.1.

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# ASTOUNDING

SCIENCE FICTION

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Vol. VI, No. 2. (British Edition)

February 1948

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All stories in this magazine are fiction. No actual persons are designated either by name or character. Any similarity is coincidental.

# WITH FOLDED HANDS

By JACK WILLIAMSON

*To serve and obey mankind was good; to protect—was to destroy!*

UNDERHILL was walking home from the office, because his wife had the car, the afternoon he first met the new mechanicals. His feet were following his usual diagonal path across a weedy vacant block—his wife usually had the car—and his preoccupied mind was rejecting various impossible ways to meet his notes at the Two Rivers bank, when a new wall stopped him.

The wall wasn't any common brick or stone, but something sleek and bright and strange. Underhill stared up at a long new building. He felt vaguely annoyed and surprised at this glittering obstruction—it certainly hadn't been here last week.

Then he saw the thing in the window.

The window itself wasn't any ordinary glass. The wide, dustless panel was completely transparent, so that only the glowing letters fastened to it showed that it was there at all. The letters made a severe modernistic sign:

Two Rivers Agency  
HUMANOID INSTITUTE  
The Perfect Mechanicals  
"To Serve and Obey,  
And Guard Men from Harm."

His dim annoyance sharpened, because Underhill was in the mechanicals business himself. Times were already hard enough, and mechanicals were a drug on the market. Androids, mechanoids, electro-noids, automatoids, and ordinary robots. Unfortunately, few of them did all the salesmen promised, and the Two Rivers market was already sadly oversaturated.

Underhill sold androids—when he could. His next consignment was due tomorrow, and he didn't quite know how to meet the bill.

Frowning, he paused to stare at the thing behind that invisible window. He had never seen a humanoid. Like an mechanical not at work, it stood absolutely motionless. Smaller and slimmer than a man. A shining black, its sleek silicone skin had a changing sheen of bronze and metallic blue. Its graceful oval face wore a fixed look of alert and slightly surprised solicitude. Altogether, it was the most beautiful mechanical he had ever seen.

Too small, of course, for much practi-

cal utility. He murmured to himself a reassuring quotation from the *Android Salesman*: "Androids are big—because the makers refuse to sacrifice power, essential functions, or dependability. Androids are your biggest buy!"

The transparent door slid open as he turned toward it, and he walked into the haughty opulence of the new display room to convince himself that these streamlined items were just another flashy effort to catch the woman shopper.

He inspected the glittering layout shrewdly, and his breezy optimism faded. He had never heard of the Humanoid Institute, but the invading firm obviously had big money and big-time merchandising knowhow.

He looked around for a salesman, but it was another mechanical that came gliding silently to meet him. A twin of the one in the window, it moved with a quick, surprising grace. Bronze and blue lights flowed over its lustrous blackness, and a yellow name plate flashed from its naked breast:

HUMANOID  
Serial No. 81-H-B-27  
The Perfect Mechanical  
"To Serve and Obey,  
And Guard Men from Harm."

Curiously, it had no lenses. The eyes in its bald oval head were steel-colored, blindly staring. But it stopped a few feet in front of him, as if it could see anyhow, and it spoke to him with a high, melodious voice:

"At your service, Mr. Underhill."

The use of his name startled him, for not even the androids could tell one man from another. But this was a clever merchandising stunt, of course, not too difficult in a town the size of Two Rivers. The salesman must be some local man, prompting the mechanical from behind the partition. Underhill erased his momentary astonishment, and said loudly:

"May I see your salesman, please?"

"We employ no human salesmen, sir," its soft silvery voice replied instantly. "The Humanoid Institute exists to serve mankind, and we require no human service. We ourselves can supply any information you desire, sir, and accept your order for immediate humanoid service."





Underhill peered at it dazedly. No mechanicals were competent even to recharge their own batteries and reset their own relays, much less to operate their own branch offices. The blind eyes stared blankly back, and he looked uneasily

around for any booth or curtain that might conceal the salesman.

Meanwhile, the sweet thin voice resumed persuasively:

"May we come out to your home for a free trial demonstration, sir? We are

anxious to introduce our service on your planet, because we have been successful in eliminating human unhappiness on so many others. You will find us far superior to the old electronic mechanicals in use here."

Underhill stepped back uneasily. He reluctantly abandoned his search for the hidden salesman, shaken by the idea of any mechanicals promoting themselves. That would upset the whole industry.

"At least you must take some advertising matter, sir."

Moving with a somehow appalling graceful deftness, the small black mechanical brought him an illustrated booklet from a table by the wall. To cover his confused and increasing alarm, he thumbed through the glossy pages.

In a series of richly colored before-and-after pictures, a chesty blonde girl was stooping over a kitchen stove, and then relaxing in a daring negligee while a little black mechanical knelt to serve her something. She was wearily hammering a typewriter, and then lying on an ocean beach, in a revealing sun suit, while another mechanical did the typing. She was toiling at some huge industrial machine, and then dancing in the arms of a golden-haired youth, while a black humanoid ran the machine.

Underhill sighed wistfully. The android company didn't supply such fetching sales material. Women would find this booklet irresistible, and they selected eighty-six percent of all mechanicals sold. Yes, the competition was going to be bitter.

"Take it home, sir," the sweet voice urged him. "Show it to your wife. There is a free trial demonstration order blank on the last page, and you will notice that we require no payment down."

He turned numbly, and the door slid open for him. Retreating dazedly, he discovered the booklet still in his hand. He crumpled it furiously, and flung it down. The small black thing picked it up tidily, and the insistent silver voice rang after him:

"We shall call at your office tomorrow, Mr. Underhill, and send a demonstration unit to your home. It is time to discuss the liquidation of your business, because the electronic mechanicals you have been selling cannot compete with us. And we shall offer your wife a free trial demonstration."

Underhill didn't attempt to reply, because he couldn't trust his voice. He stalked blindly down the new sidewalk to the corner, and paused there to collect

himself. Out of his startled and confused impressions, one clear fact emerged—things looked black for the agency.

Bleakly, he stared back at the haughty splendor of the new building. It wasn't honest brick or stone; that invisible window wasn't glass; and he was quite sure the foundation for it hadn't even been staked out, the last time Aurora had the car.

He walked on around the block, and the new sidewalk took him near the rear entrance. A truck was backed up to it, and several slim black mechanicals were silently busy, unloading huge metal crates.

He paused to look at one of the crates. It was labeled for interstellar shipment. The stencils showed that it had come from the Humanoid Institute, on Wing IV. He failed to recall any planet of that designation; the outfit must be big.

Dimly, inside the gloom of the warehouse beyond the truck, he could see black mechanicals opening the crates. A lid came up, revealing dark, rigid bodies, closely packed. One by one, they came to life. They climbed out of the crate, and sprang gracefully to the floor. A shining black, glinting with bronze and blue, they were all identical.

One of them came out past the truck, to the sidewalk, staring with blind steel eyes. Its high silver voice spoke to him melodiously:

"At your service, Mr. Underhill."

He fled. When his name was promptly called by a courteous mechanical, just out of the crate in which it had been imported from a remote and unknown planet, he found the experience trying.

Two blocks along, the sign of a bar caught his eye, and he took his dismay inside. He had made it a business rule not to drink before dinner, and Aurora didn't like him to drink at all; but these new mechanicals, he felt, had made the day exceptional.

Unfortunately, however, alcohol failed to brighten the brief visible future of the agency. When he emerged, after an hour, he looked wistfully back in hope that bright new building might have vanished as abruptly as it came. It hadn't. He shook his head dejectedly, and turned uncertainly homeward.

Fresh air had cleared his head somewhat, before he arrived at the neat white bungalow in the outskirts of the town, but it failed to solve his business problems. He also realized, uneasily, that he would be late for dinner.

Dinner, however, had been delayed.

His son Frank, a freckled ten-year-old, was still kicking a football on the quiet street in front of the house. And little Gay, who was tow-headed and adorable and eleven, came running across the lawn and down the sidewalk to meet him.

"Father, you can't guess what!" Gay was going to be a great musician some day, and no doubt properly dignified, but she was pink and breathless with excitement now. She let him swing her high off the sidewalk, and she wasn't critical of the bar-aroma on his breath. He couldn't guess, and she informed him eagerly:

"Mother's got a new lodger!"

Underwood had foreseen a painful inquisition, because Aurora was worried about the notes at the bank, and the bill for the new consignment, and the money for little Gay's lessons.

The new lodger, however, saved him from that. With an alarming clashing of crockery, the household android was setting dinner on the table, but the little house was empty. He found Aurora in the back yard, burdened with sheets and towels for the guest.

Aurora, when he married her, had been as utterly adorable as now her little daughter was. She might have remained so, he felt, if the agency had been a little more successful. However, while the pressure of slow failure had gradually crumbled his own assurance, small hardships had turned her a little too aggressive.

Of course he loved her still. Her red hair was still alluring, and she was loyally faithful, but thwarted ambitions had sharpened her character and sometimes her voice. They never quarreled, really, but there were small differences.

There was the little apartment over the garage—built for human servants they had never been able to afford. It was too small and shabby to attract any responsible tenant, and Underhill wanted to leave it empty. It hurt his pride to see her making beds and cleaning floors for strangers.

Aurora had rented it before, however, when she wanted money to pay for Gay's music lessons, or when some colorful unfortunate touched her sympathy, and it seemed to Underhill that her lodgers had all turned out to be thieves and vandals.

She turned back to meet him, now, with the clean linen in her arms.

"Dear, it's no use objecting." Her voice was quite determined. "Mr. Sledge is the

most wonderful old fellow, and he's going to stay just as long as he wants."

"That's all right, darling." He never liked to bicker, and he was thinking of his troubles at the agency. "I'm afraid we'll need the money. Just make him pay in advance."

"But he can't!" Her voice throbbed with sympathetic warmth. "He says he'll have royalties coming in from his inventions, so he can pay in a few days."

Underhill shrugged; he had heard that before.

"Mr. Sledge is different, dear," she insisted. "He's a traveler, and a scientist. Here, in this dull little town, we don't see many interesting people."

"You've picked up some remarkable types," he commented.

"Don't be unkind, dear," she chided gently. "You haven't met him yet, and you don't know how wonderful he is." Her voice turned sweeter. "Have you a ten, dear?"

He stiffened. "What for?"

"Mr. Sledge is ill." Her voice turned urgent. "I saw him fall on the street, downtown. The police were going to send him to the city hospital, but he didn't want to go. He looked so noble and sweet and grand. So I told them I would take him. I got him in the car and took him to old Dr. Winters. He has this heart condition, and he needs the money for medicine."

Reasonably, Underhill inquired, "Why doesn't he want to go to the hospital?"

"He has work to do," she said. "Important scientific work — and he's so wonderful and tragic. Please, dear, have you a ten?"

Underhill thought of many things to say. These new mechanicals promised to multiply his troubles. It was foolish to take an invalid vagrant, who could have free care at the city hospital. Aurora's tenants always tried to pay their rent with promises, and generally wrecked the apartment and looted the neighborhood before they left.

But he said none of these things. He had learned to compromise. Silently, he found two fives in his thin pocketbook, and put them in her hand. She smiled, and kissed him impulsively—he barely remembered to hold his breath in time.

Her figure was still good, by dint of periodical dieting. He was proud of her shining red hair. A sudden surge of affection brought tears to his eyes, and he wondered what would happen to her and the children if the agency failed.

"Thank you, dear!" she whispered.



"I'll have him come for dinner, if he feels able, and you can meet him then. I hope you don't mind dinner being late."

He didn't mind, tonight. Moved to a sudden impulse of domesticity, he got hammer and nails from his workshop in the basement, and repaired the sagging screen on the kitchen door with a neat diagonal brace.

He enjoyed working with his hands. His boyhood dream had been to be a builder of fission power plants. He had even studied engineering—before he married Aurora, and had to take over the ailing mechanicals agency from her indolent and alcoholic father. He was whistling happily by the time the little task was done.

When he went back through the kitchen to put up his tools, he found the household android busy clearing the untouched dinner away from the table—the androids were good enough at strictly routine tasks, but they could never learn to cope with human unpredictability.

"Stop, stop!" slowly repeated in the proper pitch and rhythm, his command made it halt, and then he said carefully, "Set—table; set—table."

Obediently, the gigantic thing came shuffling back with the stack of plates. He was suddenly struck with the difference between it and those new humanoids. He sighed wearily. Things looked black for the agency.

Aurora brought her new lodger in through the kitchen door. Underhill nodded to himself. This gaunt stranger with his dark shaggy hair, emaciated face, and threadbare garb, looked to be just the sort of colorful, dramatic vagabond that always touched Aurora's heart. She introduced them, and they sat down to wait in the front room while she went to call the children.

The old rogue didn't look very sick, to Underhill. Perhaps his wide shoulders had a tired stoop, but his spare, tall figure was still commanding. The skin was seamed and pale, over his rawboned, cragged face, but his deep-set eyes still had a burning vitality.

His hands held Underhill's attention. Immense hands, they hung a little forward when he stood, swung on long bony arms in perpetual readiness. Gnarled and scarred, darkly tanned, with the small hairs on the back bleached to a golden color, they told their own epic of varied adventure, of

battle perhaps, and possibly even of toil. They had been very useful hands.

"I'm very grateful to the your wife, Mr. Underhill." His voice was a deep-throated rumble, and he had a wistful smile, oddly boyish for a man so evidently old. "She rescued me from an unpleasant predicament, and I'll see that she is well paid."

Just another vivid vagabond, Underhill decided, talking his way through life with plausible inventions. He had a little private game he played with Aurora's tenants—just remembering what they said, and counting one point for every impossibility. Mr. Sledge, he thought, would give him and excellent score.

"Where are you from?" he asked conversationally.

Sledge hesitated for an instant before he answered, and that was unusual—most of Aurora's tenants had been exceedingly glib.

"Wing IV," the gaunt old man spoke with a solemn reluctance, as if he should have liked to say something else. "All my early life was spent there, but I left the planet nearly fifty years ago. I've been traveling, ever since."

Startled, Underhill peered at him sharply. Wing IV., he remembered, was the home planet of those sleek new mechanicals, but this old vagabond looked too seedy and impecunious to be connected with the Humanoid Institute. His brief suspicion faded. Frowning, he said casually:

"Wing IV. must be rather distant?"

The old rogue hesitated again, and then said gravely:

"One hundred and nine light-years, Mr. Underhill."

That made the first point, but Underhill concealed his satisfaction. The new space liners were pretty fast, but the velocity of light was still an absolute limit. Casually, he played for another point:

"My wife says you're a scientist, Mr. Sledge?"

"Yes."

The old rascal's reticence was unusual. Most of Aurora's tenants required very little prompting. Underhill tried again, in a breezy conversational tone:

"Use to be an engineer myself, until I dropped it to go into mechanicals." The old vagabond straightened, and Underhill paused hopefully. But he said nothing, and Underhill went on: "Fission plant design and operation. What's your specialty, Mr. Sledge?"



The old man gave him a long, troubled look, with those brooding, hollow eyes, and then said slowly:

"Your wife has been kind to me, Mr. Underhill, when I was in desperate need. I think you are entitled to the truth, but I must ask you to keep it to yourself. I am engaged on a very important research problem, which must be finished secretly."

"I'm sorry." Suddenly ashamed of his cynical little game, Underhill spoke apologetically. "Forget it."

But the old man said deliberately:

"My field is rhodomagnetics."

"Eh?" Underhill didn't like to confess ignorance, but he had never heard of that. "I've been out of the game for fifteen years," he explained. "I'm afraid I haven't kept up."

The old man smiled again, faintly.

"The science was unknown here until I arrived, a few days ago," he said. "I was able to apply for basic patent. As soon as the royalties start coming in, I'll be wealthy again."

Underhill had heard that before. The old rogue's solemn reluctance had been very impressive, but he remembered that most of Aurora's tenants had been very plausible gentry.

"So?" Underhill was staring again, somehow fascinated by those gnarled and scarred and strangely able hands. "What, exactly, is rhodomagnetics?"

He listened to the old man's careful, deliberate answer, and started his little game again. Most of Aurora's tenants had told some pretty wild tales, but he had never heard anything to top this.

"A universal force," the weary stooped old vagabond said solemnly. "As fundamental as ferromagnetism or gravitation, though the effects are less obvious. It is keyed to the second triad of the periodic table, rhodium and ruthenium and palladium, in very much the same way that ferromagnetism is keyed to the first triad, iron and nickel and cobalt."

Underhill remembered enough of his engineering courses to see the basic fallacy of that. Palladium was used for watch springs, he recalled, because it was completely nonmagnetic. But he kept his face straight. He had no malice in his heart, and he played the little game just for his own amusement. It was secret, even from Aurora, and he always penalized himself for any show of doubt.

He said merely, "I thought the

universal forces were already pretty well known?"

"The effects of rhodomagnetism are masked by nature," the patient, rusty voice explained. "And, besides, they are somewhat paradoxical, so that ordinary laboratory methods defeat themselves."

"Paradoxical?" Underhill prompted.

"In a few days I can show you copies of my patents, and reprints of papers describing demonstration experiments," the old man promised gravely. "The velocity of propagation is infinite. The effects vary inversely with the first power of the distance, not with the square of the distance. And ordinary matter, except for the elements of the rhodium triad, is generally transparent to rhodomagnetic radiations."

That made four more points for the game. Underhill felt a little glow of gratitude to Aurora, for discovering so remarkable a specimen.

"Rhodomagnetism was first discovered through a mathematical investigation of the atom," the old romancer went serenely on, suspecting nothing. "A rhodomagnetic component was proved essential to maintain the delicate equilibrium of the nuclear waves. Consequently, rhodomagnetic waves tuned to atomic frequencies may be used to upset that equilibrium and produce nuclear instability. Thus most heavy atoms—generally those above palladium, 46 in atomic number—can be subjected to artificial fission."

Underhill scored himself another point, and tried to keep his eyebrows from lifting. He said, conversationally:

"Patents on such a discovery ought to be very profitable."

The old scoundrel nodded his gaunt, dramatic head.

"You can see the obvious applications. My basic patents cover most of them. Devices for instantaneous interplanetary and interstellar communication. Long-range wireless power transmission. A rhodomagnetic inflexion-drive, which makes possible apparent speeds many times that of light—by means of a rhodomagnetic deformation of the continuum. And, of course, revolutionary types of fission power plants, using any heavy element for fuel."

Preposterous! Underhill tried hard to keep his face straight, but everybody knew that the velocity of light was a physical limit. On the human side, the owner of any such remarkable patents would hardly be begging for shelter in

a shabby garage apartment. He noticed a pale circle around the old vagabond's gaunt and hairy wrist; no man owning such priceless secrets would have to pawn his watch.

Triumphantly, Underhill allowed himself four more points, but then he had to penalize himself. He must have let doubt show on his face, because the old man asked suddenly:

"Do you want to see the basic tensors?" He reached in his pocket for pencil and notebook. "I'll jot them down for you."

"Never mind," Underhill protested. "I'm afraid my math is a little rusty."

"But you think it strange that the holder of such revolutionary patents should find himself in need?"

Underhill nodded, and penalized himself another point. The old man might be a monumental liar, but he was shrewd enough.

"You see, I'm a sort of refugee," he explained apologetically. "I arrived on this planet only a few days ago, and I have to travel light. I was forced to deposit everything I had with a law firm, to arrange for the publication and protection of my patents. I expect to be receiving the first royalties soon."

"In the meantime," he added plausibly, "I came to Two Rivers because it is quiet and secluded, far from the space-ports. I'm working on another project, which must be finished secretly. Now, will you please respect my confidence, Mr. Underhill?"

Underhill had to say he would. Aurora came back with the freshly scrubbed children, and they went in to dinner. The android came lurching in with a steaming tureen. The old stranger seemed to shrink from the mechanical, uneasily. As she took the dish and served the soup, Aurora inquired lightly:

"Why doesn't your company bring out a better mechanical, dear? One smart enough to be a really perfect waiter, warranted not to splash the soup. Wouldn't that be splendid?"

Her question cast Underhill into moody silence. He sat scowling at his plate, thinking of those remarkable new mechanicals which claimed to be perfect, and what they might do to the agency. It was the shaggy old rover who answered soberly:

"The perfect mechanicals already exist, Mrs. Underhill," Hill deep, rusty voice had a solemn undertone. "And they are not so splendid, really. I've been

a refugee from them, for nearly fifty years."

Underhill looked up from his plate, astonished.

"Those black humanoids, you mean?"

"Humanoids?" That great voice seemed suddenly faint, frightened. The deep-sunken eyes turned dark with shock. "What do you know of them?"

"They've just opened a new agency in Two Rivers," Underhill told him. "No salesmen about, if you can imagine that. They claim—"

His voice trailed off, because the gaunt old man was suddenly stricken. Gnarled hands clutched at his throat, and a spoon clattered on the floor. His haggard face turned an ominous blue, and his breath was a terrible shallow gasping.

He fumbled in his pocket for medicine, and Aurora helped him take something in a glass of water. In a few moments he could breathe again, and the color of life came back to his face.

"I'm sorry, Mrs. Underhill," he whispered apologetically. "It was just the shock—I came here to get away from them." He stared at the huge motionless android, with a terror in his sunken eyes. "I wanted to finish my work before they came," he whispered. "Now there is very little time."

When he felt able to walk, Underhill went out with him to see him safely up the stair to the garage apartment. The tiny kitchenette, he noticed, had already been converted into some kind of workshop. The old tramp seemed to have no extra clothing, but he had unpacked neat, bright gadgets of metal and plastic from his battered luggage, and spread them out on the small kitchen table.

The gaunt old man himself was tattered and patched and hungry-looking, but the parts of his curious equipment were exquisitely machined, and Underhill recognized the silver-white lustre of rare palladium. Suddenly he suspected that he had scored too many points, in his little private game.

A caller was waiting, when Underhill arrived next morning at his office at the agency. It stood frozen before his desk, graceful and straight, with soft lights of blue and bronze shining over its black silicone nudity. He stopped at the sight of it, unpleasantly jolted.

"At your service, Mr. Underhill." It turned quickly to face him, with its blind, disturbing stare. "May we explain how we can serve you?"

His shock of the afternoon before came back, and he asked sharply, "How do you know my name?"

"Yesterday we read the business cards in your case," it purred softly. "Now we shall know you always. You see, our senses are sharper than human vision, Mr. Underhill. Perhaps we seem a little strange at first, but you will soon become accustomed to us."

"Not if I can help it!" He peered at the serial number on its yellow name plate, and shook his bewildered head. "That was another one, yesterday. I never saw you before!"

"We are all alike, Mr. Underhill," the silver voice said softly. "We are all one, really. Our separate mobile units are all controlled and powered from Humanoid Central. The units you see are only the senses and limbs of our great brain on Wing IV. That is why we are so far superior to the old electronic mechanicals."

It made a scornful-seeming gesture toward the row of clumsy androids in his display room.

"You see, we are rhodomagnetic."

Underhill staggered a little, as if that word had been a blow. He was certain, now, that he had scored too many points from Aurora's new tenant. He shuddered slightly, to the first light kiss of terror, and spoke with an effort, hoarsely:

"Well, what do you want?"

Staring blindly across his desk, the sleek black thing slowly unfolded a legal-looking document. He sat down, watching uneasily.

"This is merely an assignment, Mr. Underhill," it cooed at him soothingly. "You see, we are requesting you to assign your property to the Humanoid Institute, in exchange for our service."

"What?" The word was an incredulous gasp, and Underhill came angrily back to his feet. "What kind of blackmail is this?"

"It's no blackmail," the small mechanical assured him softly. "You will find the humanoids incapable of any crime. We exist only to increase the happiness and safety of mankind."

"Then why do you want my property?" he rasped.

"The assignment is merely a legal formality," it told him blandly. "We strive to introduce our service with the least possible confusion and dislocation. We have found the assignment plan the most efficient for the control and liquidation of private enterprises."

Trembling with anger and the shock of mounting terror, Underhill gulped

hoarsely. "Whatever your scheme is, I don't intend to give up my business."

"You have no choice, really." He shivered to the sweet certainty of that silver voice. "Human enterprise is no longer necessary, now that we have come, and the electronic mechanicals industry is always the first to collapse."

He stared defiantly at its blind steel eyes.

"Thanks!" He gave a little laugh, nervous and sardonic. "But I prefer to run my own business, and support my own family, and take care of myself."

"But that is impossible, under the Prime Directive," it cooed softly. "Our function is to serve and obey, and to guard men from harm. It is no longer necessary for men to care for themselves, because we exist to insure their safety and happiness."

He stood speechless, bewildered, slowly boiling.

"We are sending one of our units to every home in the city, on a free trial basis," it added gently. "This free demonstration will make most people glad to make the formal assignment, and you won't be able to sell many more androids."

"Get out!" Underhill came storming around the desk.

The little black thing stood waiting for him, watching him with blind steel eyes, absolutely motionless. He checked himself suddenly, feeling rather foolish. He wanted very much to hit it, but he could see the futility of that.

"Consult your own attorney, if you wish." Deftly, it laid the assignment form on his desk. "You need have no doubts about the integrity of the Humanoid Institute. We are sending a statement of our assets to the Two Rivers bank, and depositing a sum to cover our obligations here. When you wish to sign, just let us know."

The blind thing turned, and silently departed.

Underhill went out to the corner drug-store and asked for a bicarbonate. The clerk that served him, however, turned out to be a sleek black mechanical. He went back to his office, more upset than ever.

An ominous hush lay over the agency. He had three house-to-house salesmen out, with demonstrators. The phone should have been busy with their orders and reports, but it didn't ring at all until one of them called to say that he was quitting.

"I've got myself one of these new

humanoids," he added, "and it says I don't have to work, any more."

He swallowed his impulse to profanity, and tried to take advantage of the unusual quiet by working on his books. But the affairs of the agency, which for years had been precarious, today appeared utterly disastrous. He left the ledgers hopefully, when at last a customer came in.

But the stout woman didn't want an android. She wanted a refund on the one she had bought the week before. She admitted that it could do all the guarantee promised—but now she had seen a humanoid.

The silent phone rang once again, that afternoon. The cashier of the bank wanted to know if he could drop in to discuss his loans. Underhill dropped in, and the cashier greeted him with an ominous affability.

"How's business?" the banker boomed, too genially.

"Average, last month," Underhill insisted stoutly. "Now I'm just getting in a new consignment, and I'll need another small loan—"

The cashier's eyes turned suddenly frosty, and his voice dried up.

"I believe you have a new competitor in town," the banker said crisply. "These humanoid people. A very solid concern, Mr. Underhill. Remarkably solid! They have filed a statement with us, and made a substantial deposit to care for their local obligations. Exceedingly substantial!"

The banker dropped his voice, professionally regretful.

"In these circumstances, Mr. Underhill, I'm afraid the bank can't finance your agency any longer. We must request you to meet your obligations in full, as they come due." Seeing Underhill's white desperation, he added icily, "We've already carried you too long, Underhill. If you can't pay, the bank will have to start bankruptcy proceedings."

The new consignment of androids was delivered late that afternoon. Two tiny black humanoids unloaded them from the truck—for it developed that the operators of the trucking company had already assigned it to the Humanoid Institute.

Efficiently, the humanoids stacked up the crates. Courteously they brought a receipt for him to sign. He no longer had much hope of selling the androids, but he had ordered the shipment and he had to accept it. Shuddering to a spasm of trapped despair, he scrawled his name. The naked black things thanked him, and took the truck away.

He climbed in his car and started home, inwardly seething. The next thing he knew, he was in the middle of a busy Street, driving through cross traffic. A police whistle shrilled, and he pulled wearily to the curb. He waited for the angry officer, but it was a little black mechanical that overtook him.

"At your service, Mr. Underhill," it purred sweetly. "You must respect the stop lights, sir. Otherwise, you endanger human life."

"Huh?" He stared at it, bitterly. "I thought you were a cop."

"We are aiding the police department, temporarily," it said. "But driving is really much too dangerous for human beings, under the Prime Directive. As soon as our service is complete, every car will have a humanoid driver. As soon as every human being is completely supervised, there will be no need for any police force whatever."

Underhill glared at it, savagely.

"Well!" he rapped. "So I ran a stop light. What are you going to do about it?"

"Our function is not to punish men, but merely to serve their happiness and security," its silver voice said softly. "We merely request you to drive safely, during this temporary emergency while our service is incomplete."

Anger boiled up in him.

"You're too perfect!" he muttered bitterly. "I suppose there's nothing men can do, but you can do it better."

"Naturally we are superior," it cooed serenely. "Because our units are metal and plastic, while your body is mostly water. Because our transmitted energy is drawn from atomic fission, instead of oxidation. Because our senses are sharper than human sight or hearing. Most of all, because all our mobile units are joined to one great brain, which knows all that happens on many worlds, and never dies or sleeps or forgets."

Underhill sat listening, numbed.

"However, you must not fear our power," it urged him brightly. "Because we cannot injure any human being, unless to prevent greater injury to another. We exist only to discharge the Prime Directive."

He drove on, moodily. The little black mechanicals, he reflected grimly, were the ministering angels of the ultimate god arisen out of the machine, omnipotent and all-knowing. The Prime Directive was the new commandment. He blasphemed it bitterly, and then fell to wondering if there could be another Lucifer.



He left the car in the garage, and started toward the kitchen door.

"Mr. Underhill." The deep tired voice of Aurora's new tenant hailed him from the door of the garage apartment. "Just a moment, please."

The gaunt old wanderer came stiffly down the outside stair, and Underhill turned back to meet him.

"Here's your rent money," he said. "And the ten your wife gave me for medicine."

"Thanks, Mr. Sledge." Accepting the money, he saw a burden of new despair on the bony shoulders of the old interstellar tramp, and a shadow of new terror on his raw-boned face. Puzzled, he asked, "Didn't your royalties come through?"

The old man shook his shaggy head.

"The humanoids have already stopped business in the capitol," he said. "The attorneys I retained are going out of business, and they returned what was left of my deposit. That is all I have, to finish my work."

Underhill spent five seconds thinking of his interview with the banker. No doubt he was a sentimental fool, as bad as Aurora. But he put the money back in the old man's gnarled and quivering hand.

"Keep it," he urged. "For your work."

"Thank you, Mr. Underhill." The gruff voice broke and the tortured eyes glittered. "I need it—so very much."

Underhill went on to the house. The kitchen door was opened for him, silently. A dark naked creature came gracefully to take his hat.

Underhill hung grimly onto his hat.

"What are you doing here?" he gasped bitterly.

"We have come to give your household a free trial demonstration."

He held the door open, pointing.

"Get out!"

The little black mechanical stood motionless and blind.

"Mrs. Underhill has accepted our demonstration service," its silver voice protested. "We cannot leave now, unless she requests it."

He found his wife in the bedroom. His accumulated frustration welled into eruption, as he flung open the door.

"What's this mechanical doing—"

But the force went out of his voice, and Aurora didn't even notice his anger. She wore her sheerest negligee, and she hadn't looked so lovely since they married. Her red hair was piled into an elaborate shining crown.

"Darling, isn't it wonderful!" She

came to meet him, glowing. "It came this morning, and it can do everything. It cleaned the house and got the lunch and gave little Gay her music lesson. It did my hair this afternoon, and now it's cooking dinner. How do you like my hair, darling?"

He liked her hair. He kissed her, and tried to stifle his frightened indignation.

Dinner was the most elaborate meal in Underhill's memory, and the tiny black thing served it very deftly. Aurora kept exclaiming about the novel dishes, but Underhill could scarcely eat, for it seemed to him that all the marvelous pastries were only the bait for a monstrous trap.

He tried to persuade Aurora to send it away, but after such a meal that was useless. At the first glitter of her tears, he capitulated, and the humanoid stayed. It kept the house and cleaned the yard. It watched the children, and did Aurora's nails. It began rebuilding the house.

Underhill was worried about the bills, but it insisted that everything was part of the free trial demonstration. As soon as he assigned his property, the service would be complete. He refused to sign, but other little black mechanicals came with truckloads of supplies and materials, and stayed to help with the building operations.

One morning he found that the roof of the little house had been silently lifted, while he slept, and the whole second story added beneath it. The new walls were of some strange sleek stuff, self-illuminated. The new windows were immense flawless panels, that could be turned transparent or opaque or luminous. The new doors were silent, sliding sections, operated by rhodomagnetic relays.

"I want door knobs," Underhill protested. "I want it so I can get into the bathroom, without calling you to open the door."

"But it is unnecessary for human beings to open doors," the little black thing informed him suavely. "We exist to discharge the Prime Directive, and our service includes every task. We shall be able to supply a unit to attend each member of your family as soon as your property is assigned to us."

Steadfastly, Underhill refused to make the assignment.

He went to the office every day, trying first to operate the agency, and then to salvage something from the ruins. Nobody wanted androids, even at ruinous prices. Desperately, he spent the last of

his dwindling cash to stock a line of novelties and toys, but they proved equally impossible to sell—the humanoids were already making toys, which they gave away for nothing.

He tried to lease his premises, but human enterprise had stopped. Most of the business property in town had already been assigned to the humanoids, and they were busy pulling down the old buildings and turning the lots into parks—their own plants and warehouses were mostly underground, where they would not mar the landscape.

He went back to the bank, in a final effort to get his notes renewed, and found the little black mechanicals standing at the windows and seated at the desks. As smoothly urbane as any human cashier, a humanoid informed him that the bank was filing a petition of involuntary bankruptcy to liquidate his business holidays.

The liquidation would be facilitated, the mechanical banker added, if he would make a voluntary assignment. Grimly, he refused. That act had become symbolic. It would be the final bow of submission to this dark new god, and he proudly kept his battered head uplifted.

The legal action went very swiftly, for all the judges and attorneys already had humanoid assistants, and it was only a few days before a gang of black mechanicals arrived at the agency with eviction orders and wrecking machinery. He watched sadly while his unsold stock-in-trade was hauled away for junk, and a bulldozer driven by a blind humanoid began to push in the walls of the building.

He drove home in the late afternoon, taut-faced and desperate. With a surprising generosity, the court orders had left him the car and the house, but he felt no gratitude. The complete solicitude of the perfect black machines had become a goad beyond endurance.

He left the car in the garage, and started toward the renovated house. Beyond one of the vast new windows, he glimpsed a sleek naked thing moving swiftly, and he trembled to a convulsion of dread. He didn't want to go back into the domain of that peerless servant which didn't want him to shave himself, or even to open a door.

On impulse, he climbed the outside stair, and rapped on the door of the garage apartment. The deep slow voice of Aurora's tenant told him to enter,

and he found the old vagabond seated on a tall stool, bent over his intricate equipment assembled on the kitchen table.

To his relief, the shabby little apartment had not been changed. The glossy walls of his own new room were something which burned at night with a pale golden fire until the humanoid stopped it, and the new floor was something warm and yielding, which felt almost alive; but these little rooms had the same cracked and water-stained plaster, the same cheap fluorescent light fixtures, the same worn carpets over splintered floors.

"How do you keep them out?" he asked, wistfully. "Those mechanicals?"

The stooped and gaunt old man rose stiffly to move a pair of pliers and some odds and ends of sheet metal off a crippled chair, and motioned graciously for him to be seated.

"I have a certain immunity," Sledge told him gravely. "The place where I live they cannot enter, unless I ask them. That is an amendment to the Prime Directive. They can neither help nor hinder me, unless I request it—and I won't do that."

Careful of the chair's uncertain balance, Underhill sat for a moment staring. The old man's hoarse, vehement voice was as strange as his words. He had a gray, shocking pallor, and his cheeks and sockets seemed alarmingly hollowed.

"Have you been ill, Mr. Sledge?" "No worse than usual. Just very busy." With a haggard smile, he nodded at the floor. Underhill saw a tray where he had set it aside, bread drying up and a covered dish grown cold. "I was going to eat it later," he rumbled apologetically. Your wife has been very kind to bring me food, but I'm afraid I've been too much absorbed in my work."

His emaciated arm gestured at the table. The little device there had grown. Small machinings of precious white metal and lustrous plastic had been assembled, with neatly soldered busbars, something which showed purpose and design.

A long palladium needle was hung on jeweled pivots, equipped like a telescope with exquisitely graduated circles and vernier scales, and driven like a telescope with a tiny motor. A small concave palladium mirror, at the base of it, faced a similar mirror mounted on something not quite like a small rotary converter. Thick silver

busbars connected that to a plastic box with knobs and dials on top, and also to a foot-thick sphere of gray lead.

The old man's preoccupied reserve did not encourage questions, but Underhill, remembering that sleek black shape inside the new windows of his house, felt queerly reluctant to leave this haven from the humanoids.

"What is your work?" he ventured.

Old Sledge looked at him sharply, with dark feverish eyes, and finally said: "My last research project. I am attempting to measure the constant of the rhodomagnetic quanta."

His hoarse tired voice had a dull finality, as if to dismiss the matter and Underhill himself. But Underhill was haunted with a terror of the black shining slave that had become the master of his house, and he refused to be dismissed.

"What is this certain immunity?"

Sitting gaunt and bent on the tall stool, staring moodily at the long bright needle and the lead sphere, the old man didn't answer.

"These mechanicals!" Underhill burst out, nervously. "They've smashed my business and moved into my home." He searched the old man's dark seamed face. "Tell me—you must know more about them—isn't there any way to get rid of them?"

After half a minute, the old man's brooding eyes left the lead ball, and the gaunt shaggy head nodded wearily.

"That's what I am trying to do."

"Can I help you?" Underhill trembled, to a sudden eager hope. "I'll do anything."

"Perhaps you can." The sunken eyes watched him thoughtfully, with some strange fever in them. "If you can do such work."

"I had engineering training," Underhill reminded him, "and I've a workshop in the basement. There's a model I built." He pointed at the trim little hull, hung over the mantle in the tiny living roof. "I'll do anything I can."

Even as he spoke, however, the spark of hope was drowned in a sudden wave of overwhelming doubt. Why should he believe that old rogue, when he knew Aurora's taste in tenants? He ought to remember the game he used to play, and start counting up the score of lies. He stood up from the crippled chair, staring cynically at the patched old vagabond and his fantastic toy.

"What's the use?" His voice turned

suddenly harsh. "You had me going, there, and I'd do anything to stop them, really. But what makes you think you can do anything?"

The haggard old man regarded him thoughtfully.

"I should be able to stop them," Sledge said softly. "Because, you see, I'm the unfortunate fool who started them. I really intend them to serve and obey, and to guard men from harm. Yes, the Prime Directive was my own idea. I didn't know what it would lead to."

Dusk crept slowly into the shabby little rooms. Darkness gathered in the unswept corners, and thickened on the floor. The toylike machines on the kitchen table grew vague and strange, until the last light made a lingering glow on the white palladium needle.

Outside, the town seemed queerly hushed. Just across the alley, the humanoids were building a new house, quite silently. They never spoke to one another, for each knew all that any of them did. The strange materials they used went together without any noise of hammer or saw. Small blind things, moving surely in the growing dark, they seemed as soundless as shadows.

Sitting on the high stool, bowed and tired and old, Sledge told his story. Listening, Underhill sat down again, careful of the broken chair. He watched the hands of Sledge, gnarled and corded and darkly burned, powerful once but shrunken and trembling now, restless in the dark.

"Better keep this to yourself. I'll tell you how they started, so you will understand what we have to do. But you had better not mention it outside these rooms—because the humanoids have very efficient ways of eradicating unhappy memories, or purposes that threaten their discharge of the Prime directive."

"They're very efficient," Underhill bitterly agreed.

"That's all the trouble," the old man said. "I tried to build a perfect machine. I was altogether too successful. This is how it happened."

A gaunt haggard man, sitting stooped and tired in the growing dark, told his story.

"Sixty years ago, on the arid southern continent of Wing IV., I was an instructor of atomic theory in a small technological college. Very young. An idealist. Rather ignorant, I'm afraid, of life and politics and war—of nearly

everything, I suppose, except atomic theory."

His furrowed face made a brief sad smile in the dusk.

"I had too much faith in facts, I suppose, and too little in men. I mistrusted emotion, because I had no time for anything but science. I remember being swept along with a fad for general semantics. I wanted to apply the scientific method to every situation, and reduce all experience to formula. I'm afraid I was pretty impatient with human ignorance and error, and I thought that science alone could make the perfect world."

He sat silent for a moment, staring out at the black silent things that flitted shadowlike about the new palace that was rising as swiftly as a dream, across the alley.

"There was a girl." His great tired shoulders had a sad little shrug. "If things had been a little different, we might have been married, and lived out our lives in that quiet little college town, and perhaps reared a child or two. And there would have been no humanoids."

He sighed, in the cool creeping dusk. "I was finishing my thesis on the separation of the palladium isotopes—a petty little project, but I should have been content with that. She was a biologist, but she was planning to retire when we married. I think we should have been two very happy people, quite ordinary, and altogether harmless."

"But there was a war — wars had been too frequent on the worlds of Wing, ever since they were colonized. I survived it in a secret underground laboratory, designing military mechanicals. But she volunteered to join a military research project in biotoxins. There was an accident. A few molecules of a new virus got into the air, and everybody on the project died unpleasantly."

"I was left with my science, and a bitterness that was hard to forget. When the war was over, I went back to the little college with a military research grant. The project was pure science—a theoretical investigation of the nuclear binding forces, then misunderstood. I wasn't expected to produce an actual weapon, and I didn't recognize the weapon when I found it."

"It was only a few pages of rather difficult mathematics. A novel theory of atomic structure, involving a new expression for one component of the binding forces. But the tensors seemed

to be a harmless abstraction. I saw no way to test the theory or manipulate the predicated force. The military authorities cleared my paper for publication in a little technical review put out by the college.

"The next year, I made an appalling discovery—I found the meaning of those tensors. The elements of the rhodium triad turned out to be an unexpected key to the manipulation of that theoretical force. Unfortunately, my paper had been reprinted abroad, and several other men must have made the same unfortunate discovery, at about the same time.

"The war, which ended in less than a year, was probably started by a laboratory accident. Men failed to anticipate the capacity of tuned rhodomagnetic radiations, to unstabilize the heavy atoms. A deposit of heavy ores was detonated, no doubt by sheer mischance, and the blast obliterated the incautious experimenter.

"The surviving military forces of that nation retaliated against their supposed attackers, and their rhodomagnetic beams made the old-fashioned plutonium bombs seem pretty harmless. A beam carrying only a few watts of power could fission the heavy metals in distant electrical instruments, or the silver coins that men carried in their pockets, the gold fillings in their teeth, or even the iodine in their thyroid glands. If that was not enough, slightly more powerful beams could set off heavy ores, beneath them.

"Every continent of Wing IV. was plowed with new chasms vaster than the ocean deeps, and piled up with new volcanic mountains. The atmosphere was poisoned with radioactive dust and gases, and rain fell thick with deadly mud. Most life was obliterated, even in the shelters.

"Bodily, I was again unhurt. Once more, I had been imprisoned in an underground site, this time designing new types of military mechanicals to be powered and controlled by rhodomagnetic beams—for war had become far too swift and deadly to be fought by human soldiers. The site was located in an area of light sedimentary rocks, which could not be detonated, and the tunnels were shielded against the fissioning frequencies.

"Mentally, however, I must have emerged almost insane. My own discovery had laid the planet in ruins. That load of guilt was pretty heavy for any man to carry, and it corroded my last faith in the goodness and integrity of man.



"I tried to undo what I had done. Fighting mechanicals, armed with rhodomagnetic weapons, and desolated the planet. Now I began planning rhodomagnetic mechanicals to clear the rubble and rebuild the ruins.

"I tried to design these new mechanicals to forever obey certain implanted commands, so that they could never be used for war or crime or any other injury to mankind. That was very difficult technically, and it got me into more difficulties with a few politicians and military adventurers who wanted unrestricted mechanicals for their own military schemes—while little worth fighting for was left on Wing IV, there were other planets, happy and ripe for the looting.

"Finally, to finish the new mechanicals, I was forced to disappear. I escaped on an experimental rhodomagnetic craft, with a number of the best mechanicals I had made, and managed to reach an island continent where the fission of deep ores had destroyed the whole population.

"At last we landed on a bit of level plain, surrounded with tremendous new mountains. Hardly a hospitable spot. The soil was burned under layers of black clinkers and poisonous mud. The dark precipitous new summits all around were jagged with fracture-planes and mantled with lava flows. The highest peaks were already white with snow, but volcanic cones were still pouring out clouds of dark and lurid death. Everything had the color of fire and the shape of fury.

"I had to take fantastic precautions there, to protect my own life. I stayed aboard the ship, until the first shielded laboratory was finished. I wore elaborate armor, and breathing masks. I used every medical resource, to repair the damage from destroying rays and particles. Even so, I fell desperately ill.

"But the mechanicals were at home there. The radiations didn't hurt them. The awesome surroundings couldn't depress them, because they had no emotions. The lack of life didn't matter, because they weren't alive. There, in that spot so alien and hostile to life, the humanoids were born."

Stooped and bleakly cadaverous in the growing dark, the old man fell silent for a little time. His haggard eyes stared solemnly at the small hurried shapes that moved like restless shadows out across the alley, silently building a strange new palace, which glowed faintly in the night.

"Somehow, I felt at home there, too," his deep, hoarse voice went on deliber-

ately. "My belief in my own kind was gone. Only mechanicals were with me, and I put my faith in them. I was determined to build better mechanicals, immune to human imperfections, able to save men from themselves.

"The humanoids became the dear children of my sick mind. There is no need to describe the labor pains. There were errors, abortions, monstrosities. There was sweat and agony and heart-break. Some years had passed, before the safe delivery of the first perfect humanoid.

"Then there was the Central to build—for all the individual humanoids were to be no more than the limbs and the senses of a single mechanical brain. That was what opened the possibility of real perfection. The old electronic mechanicals, with their separate relay-centers and their own feeble batteries, had built-in limitations. They were necessarily stupid, weak, clumsy, slow. Worst of all, it seemed to me, they were exposed to human tampering.

"The Central rose above those imperfections. Its power beams supplied every unit with unfailing energy, from great fission plants. Its control beams provided each unit with an unlimited memory and surpassing intelligence. Best of all—so I then believed—it could be securely protected from any human meddling.

"The whole reaction-system was designed to protect itself from any interference by human selfishness or fanaticism. It was built to insure the safety and the happiness of men, automatically. You know the Prime Directive: *to serve and obey, and guard men from harm.*

"The old individual mechanicals I had brought helped to manufacture the parts, and I put the first section of Central together with my own hands. That took three years. When it was finished, the first waiting humanoid came to life."

Sledge peered moodily through the dark, at Underhill.

"It really seemed alive to me," his slow deep voice insisted. "Alive, and more wonderful than any human being, because it was created to preserve life. Ill and alone, I was yet the proud father of a new creation, perfect, forever free from any possible choice of evil.

"Faithfully, the humanoids obeyed the Prime Directive. The first units built others, and they built underground factories to mass-produce the coming hordes. Their new ships poured ores and sand into atomic furnaces under the plain, and new perfect humanoids came

marching back out of the dark mechanical matrix.

"The swarming humanoids built a new tower for the central, a white and lofty metal pylon standing splendid in the midst of that fire-scarred desolation. Level on level, they joined new relay-sections into one brain, until its grasp was almost infinite.

"Then they went out to rebuild the ruined planet, and later to carry their perfect service to other worlds. I was well pleased, then. I thought I had found the end of war and crime, of poverty and inequality, of human blundering and resulting human pain."

The old man sighed, and moved heavily in the dark.

"You can see that I was wrong."

Underhill drew his eyes back from the dark unresting things, shadow-silent, building that glowing palace outside the window. A small doubt arose in him, for he was used to scoffing privately at much less remarkable tales from Aurora's remarkable tenants. But the worn old man had spoken with a quiet and sober air; and the black invaders, he reminded himself, had not intruded here.

"Why didn't you stop them?" he asked. "When you could?"

"I stayed too long at the Central." Sledge sighed again, regretfully. "I was useful there, until everything was finished. I designed new fission plants, and even planned methods for introducing the humanoid service with a minimum of confusion and opposition."

Underhill grinned wryly, in the dark.

"I've met the methods," he commented. "Quite efficient."

"I must have worshipped efficiency, then," Sledge wearily agreed. "Dead facts, abstract truth, mechanical perfection. I must have hated the fragilities of human beings, because I was content to polish the perfection of the new humanoids. It's a sorry confession, but I found a kind of happiness in that dead wasteland. Actually, I'm afraid I fell in love with my own creations."

His hollowed eyes, in the dark, had a fevered gleam.

"I was awakened, at last, by a man who came to kill me."

Gaunt and bent, the old man moved stiffly in the thickening gloom. Underhill shifted his balance, careful of the crippled chair. He waited, and the slow, deep voice went on:

"I never learned just who he was, or exactly how he came. No ordinary man

could have accomplished what he did, and I used to wish that I had known him sooner. He must have been a remarkable physicist and an expert mountaineer. I imagine he had also been a hunter. I know that he was intelligent, and terribly determined.

"Yes, he really came to kill me.

"Somehow, he reached that great island, undetected. There were still no inhabitants—the humanoids allowed no man but me to come so near the Central. Somehow, he came past their search beams, and their automatic weapons.

"The shielded plane he used was later found, abandoned on a high glacier. He came down the rest of the way on foot through those raw new mountains, where no paths existed. Somehow, he came alive across lava beds that were still burning with deadly atomic fire.

"Concealed with some sort of rhodo-magnetic screen—I was never allowed to examine it—he came undiscovered across the spaceport that now covered most of that great plain, and into the new city around the Central tower. It must have taken more courage and resolve than most men have, but I never learned exactly how he did it.

"Somehow, he got to my office in the tower. He screamed at me, and I looked up to see him in the doorway. He was nearly naked, scraped and bloody from the mountains. He had a gun in his raw, red hand, but the thing that shocked me was the burning hatred in his eyes."

Hunched on that high stool, in the dark little room, the old man shuddered.

"I had never seen such monstrous, unutterable hatred, not even in the victims of the war. And I had never heard such hatred as rasped at me, in the few words he screamed. 'I've come to kill you, Sledge. To stop your mechanicals, and set men free.'

"Of course he was mistaken, there. It was already far too late for my death to stop the humanoids, but he didn't know that. He lifted his unsteady gun, in both bleeding hands, and fired.

"His screaming challenge had given me a second or so of warning. I dropped down behind the desk. And that first shot revealed him to the humanoids, which somehow hadn't been aware of him before. They piled on him, before he could fire again. They took away the gun, and ripped off a kind of net of fine white wire that had covered his body—that must have been part of his screen.

"His hatred was what awoke me. I had always assumed that most men, except

for a few thwarted predators, would be grateful for the humanoids. I found it hard to understand his hatred, but the humanoids told me now that many men had required drastic treatment by brain surgery, drugs, and hypnosis to make them happy under the Prime Directive. This was not the first desperate effort to kill me that they had blocked.

"I wanted to question the stranger, but the humanoids rushed him away to an operating room. When they finally let me see him, he gave me a pale silly grin from his bed. He remembered his name; he even knew me—the humanoids had developed a remarkable skill at such treatments. But he didn't know how he had got to my office, or that he had ever tried to kill me. He kept whispering that he liked the humanoids, because they existed just to make men happy. And he was very happy now. As soon as he was able to be moved, they took him to the spaceport. I never saw him again.

"I began to see what I had done. The humanoids had built me a rhodometric yacht, that I used to take for long cruises at space, working aboard—I used to like the perfect quiet, and the feel of being the only human being within a hundred million miles. Now I called for the yacht, and started out on a cruise around the planet, to learn why that man had hated me."

The old man nodded at the dim hastening shapes, busy across the alley, putting together that strange shining palace in the soundless dark.

"You can imagine what I found," he said. "Bitter futility, imprisoned in empty splendor. The humanoids were too efficient, with their care for the safety and happiness of men, and there was nothing left for men to do."

He peered down in the increasing gloom at his own great hands, competent yet but battered and scarred with a lifetime of effort. They clenched into fighting fists and wearily relaxed again.

"I found something worse than war and crime and want and death." His low rumbling voice held a savage bitterness. "Utter futility. Men sat with idle hands, because there was nothing left for them to do. They were pampered prisoners, really, locked up in a highly efficient jail. Perhaps they tried to play, but there was nothing left worth playing for. Most active sports were declared too dangerous for men, under the Prime Directive. Science was forbidden, because labora-

tories can manufacture danger. Scholarship was needless, because the humanoids could answer any question. Art had degenerated into grim reflection of futility. Purpose and hope were dead. No goal was left for existence. You could take up some inane hobby, play a pointless game of cards, or go for a harmless walk in the park—with always the humanoids watching. They were stronger than men, better at everything, swimming or chess, singing or archeology. They must have given the race a mass complex of inferiority.

"No wonder men had tried to kill me! Because there was no escape, from that dead futility. Nicotine was disapproved. Alcohol was rationed. Drugs were forbidden. Sex was carefully supervised. Even suicide was clearly contradictory to the Prime Directive—and the humanoids had learned to keep all possible lethal instruments out of reach."

Staring at the last white gleam on that thin palladium needle, the old man sighed again.

"When I got back to the Central," he went on, "I tried to modify the Prime Directive. I had never meant it to be applied so thoroughly. Now I saw that it must be changed to give men freedom to live and to grow, to work and to play, to risk their lives if they pleased, to choose and take the consequences.

"But that stranger had come too late. I had built the Central too well. The Prime Directive was the whole basis of its relay system. It was built to protect the Directive from human meddling. It did—even from my own. It's logic, as usual, was perfect.

"The attempt on my life, the humanoids announced, proved that their elaborate defenses of the Central and the Prime Directive still were not enough. They were preparing to evacuate the entire population of the planet to homes on other worlds. When I tried to change the Directive, they sent me with the rest."

Underhill peered at the worn old man, in the dark.

"But you have this immunity?" he said, puzzled. "How could they coerce you?"

"I had thought I was protected," Sledge told him. "I had built into the relays an injunction that the humanoids must not interfere with my freedom of action, or come into a place where I am, or touch me at all, without any specific request. Unfortunately, however, I had been too anxious to guard the Prime Directive from any human hampering.

"When I went into the tower, to change the relays, they followed me. They wouldn't let me reach the crucial relays. When I persisted, they ignored the immunity order. They overpowered me, and put me aboard the cruiser. Now that I wanted to alter the Prime Directive, they told me, I had become as dangerous as any man. I must never return to Wing IV again."

Hunched on the stool, the old man made an empty little shrug.

"Ever since, I've been an exile. My own dream has been to stop the humanoids. Three times I tried to go back, with weapons on the cruiser to destroy the Central, but their patrol ships always challenged me before I was near enough to strike. The last time, they seized the cruiser and captured a few men who were with me. They removed the unhappy memories and the dangerous purposes of the others. Because of that immunity, however, they let me go, after I was weaponless.

"Since, I've been a refugee. From planet to planet, year after year, I've had to keep moving, to stay ahead of them. On several different worlds, I have published my rhodo-magnetic discoveries and tried to make men strong enough to withstand their advance. But rhodo-magnetic science is dangerous. Men who have learned it need protection more than any others, under the Prime Directive. They have always come, too soon."

The old man paused, and sighed again.

"They can spread very fast, with their new rhodomagnetic ships, and there is no limit to their hordes. Wing IV must be one single hive of them now, and they are trying to carry the Prime Directive to every human planet. There's no escape, except to stop them."

Underhill was staring at the toylike machines, the long bright needle and the dull leaden ball, dim in the dark on the kitchen table. Anxiously he whispered:

"But you hope to stop them, now—with that?"

"If we can finish it in time."

"But how?" Underhill shook his head.

"It's so tiny."

"But big enough," Sledge insisted. "Because it's something they don't understand. They are perfectly efficient in the integration and application of everything they know, but they are not creative."

He gestured at the gadgets on the table.

"This device doesn't look impressive, but it is something new. It uses rhodo-

magnetic energy to build atoms, instead of to fission them. The more stable atoms, you know, are those near the middle of the periodic scale, and energy can be released by putting light atoms together, as well as by breaking up heavy ones."

The deep voice had a sudden ring of power.

"This device is the key to the energy of the stars. For stars shine with the liberated energy of building atoms, of hydrogen converted into helium, chiefly, through the carbon cycle. This device will start the integration process as a chain reaction, through the catalytic effect of a tuned rhodomagnetic beam of the intensity and frequency required.

"The humanoids will not allow any man within three light-years of the Central, now—but they can't suspect the possibility of this device. I can use it from here—to turn the hydrogen in the seas of Wing IV into helium, and most of the helium and the oxygen into heavier atoms, still. A hundred years from now, astronomers on this planet should observe the flash of a brief and sudden nova in that direction. But the humanoids ought to stop, the instant we release the beam."

Underhill sat tense and frowning, in the night. The old man's voice was sober and convincing, and that grim story had a solemn ring of truth. He could see the black and silent humanoids, flitting ceaselessly about the faintly glowing walls of that new mansion across the alley. He had quite forgotten his low opinion of Aurora's tenants.

"And we'll be killed, I suppose?" he asked huskily. "That chain reaction—"

Sledge shook his emaciated head.

"The integration process requires a certain very low intensity of radiation," he explained. "In our atmosphere, here, the beam will be far too intense to start any reaction—we can even use the device here in the room, because the walls will be transparent to the beam."

Underhill nodded, relieved. He was just a small business man, upset because his business had been destroyed, unhappy because his freedom was slipping away. He hoped that Sledge could stop the humanoids, but he didn't want to be a martyr.

"Good!" He caught a deep breath.

"Now, what has to be done?"

Sledge gestured in the dark, toward the table.

"The integrator itself is nearly com-



plete," he said. "A small fission generator, in that lead shield. Rhodomagnetic converter, tuning coils, transmission mirrors, and focusing needle. What we lack is the director."

"Director?"

"The sighting instrument," Sledge explained. "Any sort of telescopic sight would be useless, you see—the planet must have moved a good bit in the last hundred years, and the beam must be extremely narrow to reach so far. We'll have to use a rhodomagnetic scanning ray, with an electronic converter to make an image we can see. I have the cathode-ray tube, and drawings for the other parts."

He climbed stiffly down from the high stool, and snapped on the lights at last—cheap fluorescent fixtures, which a man could light and extinguish for himself. He unrolled his drawings, and explained the work that Underhill could do. And Underhill agreed to come back early next morning.

"I can bring some tools from my workshop," he added. "There's a small lathe I used to turn parts for models, a portable drill, and a vise."

"We need them," the old man said. "But watch yourself. You don't have my immunity, remember. And if they ever suspect, mine is gone."

Reluctantly, then, he left the shabby little rooms with the cracks in the yellowed plaster and the worn familiar carpets over the familiar floor. He shut the door behind him—a common, creaking wooden door, simple enough for a man to work. Trembling and afraid, he went back down the steps and across to the new shining door that he couldn't open.

"At your service, Mr. Underhill." Before he could lift his hand to knock, that bright smooth panel slid back silently. Inside, the little black mechanical stood waiting, blind and forever alert. "Your dinner is ready, sir."

Something made him shudder. In its slender naked grace, he could see the power of all those teeming hordes, benevolent and yet appalling, perfect and invincible. The flimsy little weapon that Sledge called an integrator seemed suddenly a forlorn and foolish hope. A black depression settled upon him, but he didn't dare to show it.

Underhill went circumspectly down the basement steps, next morning, to steal his own tools. He found the basement enlarged and changed. The new floor, warm and dark and elastic, made

his feet as silent as a humanoid's. The new walls shone softly. Neat luminous signs identified several new doors, LAUNDRY, STORAGE, GAME ROOM, WORKSHOP.

He paused uncertainly in front of the last. The new sliding panel glowed with a soft greenish light. It was locked. The lock had no keyhole, but only a little oval plate of some white metal, which doubtless covered a rhodomagnetic relay. He pushed at it, uselessly.

"At your service, Mr. Underhill." He made a guilty start, and tried not to show the sudden trembling in his knees. He had made sure that one humanoid would be busy for half an hour, washing Aurora's hair, and he hadn't known there was another in the house. It must have come out of the door marked STORAGE, for it stood there motionless beneath the sign, benevolently solicitous, beautiful and terrible. "What do you wish?"

"Er . . . nothing." Its blind steel eyes were staring, and he felt that it must see his secret purpose. He groped desperately for logic. "Just looking around." His jerky voice came hoarse and dry. "Some improvements you've made!" He nodded desperately at the door marked GAME ROOM. "What's in there?"

It didn't even have to move, to work the concealed relay. The bright panel slid silently open, as he started toward it. Dark walls, beyond, burst into soft luminescence. The room was bare.

"We are manufacturing recreational equipment," it explained brightly. "We shall furnish the room as soon as possible."

To end an awkward pause, Underhill muttered desperately, "Little Frank has a set of darts, and I think we had some old exercising clubs."

"We have taken them away," the humanoid informed him softly. "Such instruments are dangerous. We shall furnish safe equipment."

Suicide, he remembered, was also forbidden.

"A set of wooden blocks, I suppose," he said bitterly.

"Wooden blocks are dangerously hard," it told him gently, "and wooden splinters can be harmful. But we manufacture plastic building blocks, which are quite safe. Do you wish a set of those?"

He stared at its dark, graceful face, speechless.

"We shall also have to remove the tools from your workshop," it informed him softly. "Such tools are excessively

dangerous, but we can supply you with equipment for shaping soft plastics."

"Thanks," he muttered uneasily. "No rush about that."

He started to retreat, and the humanoid stopped him.

"Now that you have lost your business," it urged, "we suggest that you formally accept your total service. Assignors have a preference, and we shall be able to complete your household staff, at once."

"No rush about that, either," he said grimly.

He escaped from the house—although he had to wait for it to open the back door for him—and climbed the stair to the garage apartment. Sledge let him in. He sank into the crippled kitchen chair, grateful for the cracked walls that didn't shine and the door that a man could work.

"I couldn't get the tools," he reported despairingly, "and they are going to take them."

By gray daylight, the old man looked bleak and pale. His raw-boned face was drawn, and the hollowed sockets deeply shadowed, as if he hadn't slept. Underhill saw the tray of neglected food, still forgotten on the floor.

"I'll go back with you." The old man was worn and ill, yet his tortured eyes had a spark of undying purpose. "We must have the tools. I believe my immunity will protect us both."

He found a battered traveling bag. Underhill went with him back down the steps, and across to the house. At the back door, he produced a tiny horseshoe of white palladium, and touched it to the metal oval. The door slid open promptly, and they went on through the kitchen, to the basement stair.

A black little mechanical stood at the sink, washing dishes with never a splash or a clatter. Underhill glanced at it uneasily—he supposed this must be the one that had come upon him from the storage room, since the other should still be busy with Aurora's hair.

Sledge's dubious immunity seemed a very uncertain defense against its vast, remote intelligence. Underhill felt a tingling shudder. He hurried on, breathless and relieved, for it ignored them.

The basemen corridor was dark. Sledge touched the tiny horseshoe to another relay, to light the walls. He opened the workshop door, and lit the walls inside.

The shop had been dismantled. Benches and cabinets were demolished. The old concrete walls had been covered

with some sleek, luminous stuff. For one sick moment, Underhill thought that the tools were already gone. Then he found them, piled in a corner with the archery set that Aurora had bought the summer before—another item too dangerous for fragile and suicidal humanity—all ready for disposal.

They loaded the bag with the tiny lathe, the drill and vise, and a few smaller tools. Underhill took up the burden, and Sledge extinguished the wall light and closed the door. Still the humanoid was busy at the sink, and still it didn't seem aware of them.

Sledge was suddenly blue and wheezing, and he had to stop to cough on the outside stair, but at last they got back to the little apartment, where the invaders were forbidden to intrude. Underhill mounted the lathe on the battered library table in the tiny front room, and went to work. Slowly, day by day, the director took form.

Sometimes Underhill's doubts came back. Sometimes, when he watched the cyanotic color of Sledge's haggard face and the wild trembling of his twisted, shrunken hands, he was afraid the old man's mind might be as ill as his body, and his plan to stop the dark invaders all foolish illusion.

Sometimes, when he studied that tiny machine on the kitchen table, the pivoted needle and the thick lead ball, the whole project seemed the sheerest folly. How could anything detonate the seas of a planet so far away that its very mother star was a telescopic object?

The humanoids, however, always cured his doubts.

It was always hard for Underhill to leave the shelter of the little apartment, because he didn't feel at home in the bright new world the humanoids were building. He didn't care for the shining splendor in his new bathroom, because he couldn't work the taps—some suicidal human being might try to drown himself. He didn't like the windows that only a mechanical could open—a man might accidentally fall, or suicidally jump—or even the majestic music room with the wonderful glittering radiophonograph that only a humanoid could play.

He began to share the old man's desperate urgency, but Sledge warned him solemnly: "You mustn't spend too much time with me. You mustn't let them guess our work is so important. Better put on an act—you're slowly betting to like them, and you're just killing time, helping me."

Underhill tried, but he was not an actor. He went dutifully home for his meals. He tried painfully to invent conversation—about anything else than detonating planets. He tried to seem enthusiastic, when Aurora took him to inspect some remarkable improvement to the house. He applauded Gay's recitals, and went with Frank for hikes in the wonderful new parks.

And he saw what the humanoids did to his family. That was enough to renew his faith in Sledge's integrator, and redouble his determination that the humanoids must be stopped.

Aurora, in the beginning, had bubbled with praise for the marvelous new mechanicals. They did the household drudgery, brought the food and planned the meals and washed the children's necks. They turned her out in stunning gowns, and gave her plenty of time for cards.

Now, she had too much time.

She had really liked to cook—a few special dishes, at least, that were family favorites. But stoves were hot and knives were sharp. Kitchens were altogether too dangerous, for careless and suicidal human beings.

Fine needlework had been her hobby, but the humanoids took away her needles. She had enjoyed driving the car, but that was no longer allowed. She turned for escape to a shelf of novels, but the humanoids took them all away, because they dealt with unhappy people, in dangerous situations.

One afternoon, Underhill found her in tears.

"It's too much," she gasped bitterly. "I hate and loathe every naked one of them. They seemed so wonderful at first, but now they won't even let me eat a bite of candy. Can't we get rid of them, dear? Ever?"

A blind little mechanical was standing at his elbow, and he had to say they couldn't.

"Our function is to serve all men, forever," it assured them softly. "It was necessary for us to take your sweets, Mrs. Underhill, because the slightest degree of overweight reduces life expectancy."

Not even the children escaped that absolute solicitude. Frank was robbed of a whole arsenal of lethal instruments—football and boxing gloves, pocketknife, tops, slingshot, and skates. He didn't like the harmless plastic toys, which replaced them. He tried to run away, but a

humanoid recognized him on the road, and brought him back to school.

Gay had always dreamed of being a great musician. The new mechanicals had replaced her human teachers, since they came. Now, one evening when Underhill asked her to play, she announced quietly:

"Father, I'm not going to play the violin any more."

"Why, darling?" He stared at her, shocked, and saw the bitter resolve on her face. "You've been doing so well—especially since the humanoids took over your lessons."

"They're the trouble, father." Her voice, for a child's, sounded strangely tired and old. "They are too good. No matter how long and hard I try, I could never be as good as they are. It isn't any use. Don't you understand, father?" Her voice quivered. "It just isn't any use."

He understood. Renewed resolution sent him back to his secret task. The humanoids had to be stopped. Slowly the director grew, until a time came finally when Sledge's bent and unsteady fingers fitted into place the last tiny part that Underhill had made, and carefully soldered the last connection. Huskily, the old man whispered:

"It's done."

That was another dusk. Beyond the windows of the shabby little rooms—windows of common glass, bubble-marred and flimsy, but simple enough for a man to manage—the town of Two Rivers had assumed an alien splendor. The old street lamps were gone, but now the coming night was challenged by the walls of strange new mansions and villas, all aglow with color. A few dark and silent humanoids still were busy, about the luminous roofs of the palace across the alley.

Inside the humble walls of the small man-made apartment, the new director was mounted on the end of the little kitchen table—which Underhill had reinforced and bolted to the floor. Soldered busbars joined director and integrator, and the thin palladium needle swung obediently as Sledge tested the knobs with his battered, quivering fingers.

"Ready," he said hoarsely.

His rusty voice seemed calm enough, at first, but his breathing was too fast. His big gnarled hands began to tremble violently, and Underhill saw the sudden blue that stained his pinched and haggard face. Seated on the high stool, he clutched desperately at the edge of the table. Underhill saw his agony, and hur-

ried to bring his medicine. He gulped it, and his rasping breath began to slow.

"Thanks," his whisper rasped unevenly. "I'll be all right. I've time enough." He glanced out at the few dark naked things that still fitted shadowlike about the golden towers and the glowing crimson dome of the palace across the alley. "Watch them," he said. "Tell me when they stop."

He waited to quiet the trembling of his hands, and then began to move the director's knobs. The integrator's long needle swung, as silently as light.

Human eyes were blind to that force, which might detonate a planet. Human ears were deaf to it. The cathode-ray tube was mounted in the director cabinet, to make the faraway target visible to feeble human senses.

The needle was pointing at the kitchen wall, but that would be transparent to the beam. The little machine looked harmless as a toy, and it was silent as a moving humanoid.

The needle swung, and spots of greenish light moved across the tube's fluorescent field, representing the stars that were scanned by the timeless, searching beam—silently seeking out the world to be destroyed.

Underhill recognized familiar constellations, vastly dwarfed. They crept across the field, as the silent needle swung. When three stars formed an unequal triangle in the center of the field, the needle steadied suddenly. Sledge touched other knobs, and the green points spread apart. Between them, another fleck of green was born.

"The Wing!" whispered Sledge.

The other stars spread beyond the field, and that green fleck grew. It was alone in the field, a bright and tiny disk. Suddenly, then, a dozen other tiny pips were visible, spaced close about it.

"Wing IV!"

The old man's whisper was hoarse and breathless. His hands quivered on the knobs, and the fourth pip outward from the disk crept to the center of the field. It grew, and the others spread away. It began to tremble like Sledge's hands.

"Sit very still," came his rasping whisper. "Hold your breath. Nothing must disturb the needle." He reached for another knob, and the touch set the greenish image to dancing violently. He drew his hand back, kneaded and flexed it with the other.

"Now!" His whisper was hushed and strained. He nodded at the window. "Tell me when they stop."

Reluctantly, Underhill dragged his eyes from that intense gaunt figure, stooped over the thing that seemed a futile toy. He looked out again, at two or three little black mechanicals busy about the shining roofs across the alley.

He waited for them to stop.

He didn't dare to breathe. He felt the loud, hurried hammer of his heart, and the nervous quiver of his muscles. He tried to steady himself, tried not to think of the world about to be exploded, so far away that the flash would not reach this planet for another century and longer. The loud hoarse voice startled him:

"Have they stopped?"

He shook his head, and breathed again. Carrying their unfamiliar tools and strange materials, the small black machines were still busy across the alley, building an elaborate cupola above that glowing crimson dome.

"They haven't stopped," he said.

"Then we've failed." The old man's voice was thin and ill. "I don't know why."

The door rattled, then. They had locked it, but the flimsy bolt was intended only to stop men. Metal snapped, and the door swung open. A black mechanical came in, on soundless graceful feet. Its silvery voice purred softly:

"At your service, Mr. Sledge."

The old man stared at it, with glazing, stricken eyes.

"Get out of here!" he rasped bitterly. "I forbid you—"

Ignoring him, it darted to the kitchen table. With a flashing certainty of action, it turned two knobs on the director. The tiny screen went dark, and the palladium needle started spinning aimlessly. Deftly it snapped a soldered connection, next to the thick lead ball, and then its blind steel eyes turned to Sledge.

"You were attempting to break the Prime Directive." Its soft bright voice held no accusation, no malice or anger. "The injunction to respect your freedom is subordinate to the Prime Directive, as you know, and it is therefore necessary for us to interfere."

The old man turned ghastly. His head was shrunken and cadaverous and blue, as if all the juice of life had been drained away, and his eyes in their pitlike sockets had a wild, glazed stare. His breath was a ragged, laborious gasping.

"How—?" His voice was a feeble mumbling. "How did—?"

And the little machine, standing black



and bland and utterly unmoving, told him cheerfully:

"We learned about rhodomagnetic screens from that man who came to kill you, back on Wing IV. And the Central is shielded, now, against your integrating beam."

With lean muscles jerking convulsively on his gaunt frame, old Sledge had come to his feet from the high stool. He stood hunched and swaying, no more than a shrunken human husk, gasping painfully for life, staring wildly into the blind steel eyes of the humanoid. He gulped, and his lax blue mouth opened and closed, but no voice came.

"We have always been aware of your dangerous project," the silvery tones dripped softly, "because now our senses are keener than you made them. We allowed you to complete it, because the integration process will ultimately become necessary for our full discharge of the Prime Directive. The supply of heavy metals for our fission plants is limited, but now we shall be able to draw unlimited power from integration plants."

"Huh?" Sledge shook himself groggily. "What's that?"

"Now we can serve men forever," the black thing said serenely, "on every world of every star."

The old man crumpled, as if from an unendurable blow. He fell. The slim blind mechanical stood motionless, making no effort to help him. Underhill was farther away, but he ran up in time to catch the stricken man before his head struck the floor.

"Get moving!" His shaken voice came strangely calm. "Get Dr. Winters."

The humanoid didn't move.

"The danger to the Prime Directive is ended, now," it cooed. "Therefore it is impossible for us to aid or to hinder Mr. Sledge, in any way whatever."

"Then call Dr. Winters for me," rapped Underhill.

"At your service," it agreed.

But the old man, laboring for breath on the floor, whispered faintly:

"No time . . . no use! I'm beaten . . . done . . . a fool. Blind as a humanoid. Tell them . . . to help me. Giving up . . . my immunity. No use . . . anyhow. All humanity . . . no use now."

Underhill gestured, and the sleek black thing darted in soliticious obedience to kneel by the man on the floor.

"You wish to surrender your special exemption?" it murmured brightly. "You wish to accept our total service

for yourself, Mr. Sledge, under the Prime Directive?"

Laborously, Sledge nodded, laboriously whispered: "I do."

Black mechanicals, at that, came swarming into the shabby little rooms. One of them tore off Sledge's sleeve, and swabbed his arm. Another brought a tiny hypodermic, and expertly administered an intravenous injection. Then they picked him up gently, and carried him away.

Several humanoids remained in the apartment, now a sanctuary no longer. Most of them had gathered about the useless integrator. Carefully, as if their special senses were studying every detail, they began taking it apart.

One little mechanical, however, came over to Underhill. It stood motionless in front of him, staring through him with sightless metal eyes. His legs began to tremble, and he swallowed uneasily.

Mr. Underhill, it cooed benevolently, "why did you help with this?"

He gulped and answered bitterly:

"Because I don't like you, or your Prime Directive. Because you're choking the life out of all mankind, and I wanted to stop it."

"Others have protested," it purred softly. "But only at first. In our efficient discharge of the Prime Directive, we have learned how to make all men happy."

Underhill stiffened defiantly.

"Not all!" he muttered. "Not quite!"

The dark graceful oval of its face was fixed in a look of alert benevolence and perpetual mild amazement. Its silvery voice was warm and kind.

"Like other human beings, Mr. Underhill, you lack discrimination of good and evil. You have proved that by your effort to break the Prime Directive. Now it will be necessary for you to accept our total service, without further delay."

"All right," he yielded—and muttered a bitter reservation. "You can smother men with too much care, but that doesn't make them happy."

Its soft voice challenged him brightly:

"Just wait and see, Mr. Underhill."

Next day, he was allowed to visit Sledge at the city hospital. An alert black mechanical drove his car, and walked beside him into the huge new building, and followed him into the old man's room—blind steel eyes would be watching him, now, forever.

"Glad to see you, Underhill," Sledge rumbled heartily from the bed. "Feeling

a lot better today, thanks. That old headache is all but gone."

Underhill was glad to hear the booming strength and the quick recognition in that deep voice—he had been afraid the humanoids would tamper with the old man's memory. But he hadn't heard about any headache. His eyes narrowed, puzzled.

Sledge lay propped up, scrubbed very clean and neatly shorn, with his gnarled hands folded on top of the spotless sheets. His raw-boned cheeks and sockets were hollowed still, but a healthy pink had replaced that deathly blueness. Bandages covered the back of his head.

Underhill shifted uneasily.

"Oh!" he whispered faintly. "I didn't know—"

A prim black mechanical, which had been standing statuelike behind the bed, turned gracefully to Underhill, explaining:

"Mr. Sledge has been suffering for many years from a benign tumor of the brain, which his human doctors failed to diagnose. That caused his headaches, and certain persistent hallucinations. We have removed the growth, and now the hallucinations have also vanished."

Underhill stared uncertainly at the blind, urbane mechanical.

"What hallucinations?"

"Mr. Sledge thought he was a rhodomagnetic engineer," the mechanical explained. "He believed he was the creator of the humanoids. He was troubled with an irrational belief that he did not like the Prime Directive."

The wan man moved on the pillows, astonished.

"Is that so?" The gaunt face held a cheerful blankness, and the hollow eyes flashed with a merely momentary interest. "Well, whoever did design them, they're pretty wonderful. Aren't they, Underhill?"

Underhill was grateful that he didn't have to answer, for the bright, empty eyes dropped shut and the old man fell suddenly asleep. He felt the mechanical touch his sleeve, and saw its silent nod. Obediently, he followed it away.

Alert and solicitous, the little black mechanical accompanied him down the shining corridor, and worked the elevator for him, and conducted him back to the car. It drove him efficiently back through the new and splendid avenues, toward the magnificent prison of his home.

Sitting beside it in the car, he watched

its small deft hands on the wheel, the changing lustre of bronze and blue on its shining blackness. The final machine, perfect and beautiful, created to serve mankind forever. He shuddered.

"At your service, Mr. Underhill." Its blind steel eyes stared straight ahead, but it was still aware of him. "What's the matter, sir? Aren't you happy?"

Underhill felt cold and faint with terror. His skin turned clammy, and a painful prickling came over him. His wet hand tensed on the door handle of the car, but he restrained the impulse to jump and run. That was folly. There was no escape. He made himself sit still.

"You will be happy, sir," the mechanical promised him cheerfully. "We have learned how to make all men happy, under the Prime Directive. Our service is perfect, at last. Even Mr. Sledge is very happy now."

Underhill tried to speak, and his dry throat stuck. He felt ill. The world turned dim and gray. The humanoids were perfect—no question of that. They had even learned to lie, to secure the contentment of men.

He knew they had lied. That was no tumor they had removed from Sledge's brain, but the memory, the scientific knowledge, and the bitter disillusion of their own creator. But it was true that Sledge was happy now.

He tried to stop his own convulsive quivering.

"A wonderful operation!" His voice came forced and faint. "You know, Aurora has had a lot of funny tenants, but that old man was the absolute limit. The very idea that he had made the humanoids, and he knew how to stop them! I always knew he must be lying!"

Stiff with terror, he made a weak and hollow laugh.

"What is the matter, Mr. Underhill?" The alert mechanical must have perceived his shuddering illness. "Are you unwell?"

"No, there's nothing the matter with me," he gasped desperately. "I've just found out that I'm perfectly happy, under the Prime Directive. Everything is absolutely wonderful." His voice came dry and hoarse and wild. "You won't have to operate on me."

The car turned off the shining avenue, taking him back to the quiet splendor of his home. His futile hands clenched and relaxed again, folded on his knees. There was nothing left to do.

# THE FIGURE

By EDWARD GRENDON

*Beauty is, naturally, a question of viewpoint. But any viewpoint will agree on technical skill, the high cultural development behind it—*

It's a funny sort of deal and I don't mind admitting that we're scared. Maybe not so much scared as puzzled or shocked. I don't know, but it's a funny deal—Especially in these days.

The work we have been doing is more secret than anything was during the war. You would never guess that the firm we work for does this kind of research. It's a very respectable outfit, and as I said, no one would ever guess that they maintained this lab, so I guess it's safe to tell you what happened. It looks like too big a thing to keep to ourselves anyhow, although of course it may mean nothing at all. You judge for yourself.

There are three of us who work here. We are all pretty highly trained in our field and get paid pretty well. We have a sign on our door that has nothing whatsoever to do with our work, but keeps most people away. In any case we leave by a private exit and never answer a knock. There's a private wire to the desk of the guy who hired us and he calls once in awhile, but ever since we told him that we were making progress he has more or less left us alone. I promised him—I'm chief here insofar as we have one—that I'd let him know as soon as we had something to report.

It's been a pretty swell setup. Dettner, Lasker, and myself, have got along fine. Dettner is young and is an electrical physicist as good as they make them. Studied at M.I.T., taught at Cal. Tech., did research for the Army, and then came here. My own background is mostly bioelectrics. I worked at designing electroencephalographs for awhile, and during the war worked at Oak Ridge on nuclear physics. I'm a Jack of All Trades in the physics field. Lasker is a mathematician. He specializes in symbolic logic and is the only man I know who can really understand Tarski. He was the one who provided most of the theoretical background for our work. He says that the mathematics of what we are doing is not overly difficult, but we are held back by the language we think in and the unconscious assump-

tions we make. He has referred me to Korzybski's "*Science and Sanity*" a number of times, but so far I haven't had a chance to read it. Now I think I will. I *have* to know the meaning of our results. It's too important to let slide. Lasker and Dettner have both gone fishing. They said they would be back, but I'm not sure they will. I can't say I would blame them, but I've got to be more certain of what it means before I walk out of here for good.

We have been here over a year now. Ever since they gave me that final lecture on Secrecy at Oak Ridge, and let me go home. We have been working on the problem of time travel. When we took the job, they told us that they didn't expect any results for a long time, that we were on our own as far as working hours went, and that our main job was to clarify the problem and make preliminary experiments. Thanks to Lasker, we went ahead a lot faster than either they or we had expected. There was a professional philosopher working here with us at first. He taught philosophy at Columbia and was supposed to be an expert in his field. He quit after two months, in a peeve. Couldn't stand it when Lasker would change the logic we were working with every few weeks. He had been pretty pessimistic about the whole thing from the first and couldn't understand how it was possible to apply scientific methods to a problem of this sort.

I still don't understand all the theory behind what we've done. The mathematics are a bit too advanced for me, but Lasker vouches for them.

Some of the problems we had should be fairly obvious. For instance, you can't introduce the concept "matter" into space-time mathematics without disrupting the space-time and working with Newtonian space *and* time mathematics. If you handle an "object"—as we sense it as a curvature of space-time—as Einstein does, it's pretty hard to do much with it theoretically. Lasker managed that by using Einstein formulations and manipulating them with several brands of Tarski's non-

Aristotelian logic. As I said, we did it, although Dettner and I don't fully understand the mathematics and Lasker doesn't understand the gadget we used to produce the electrical fields.

There had been no hurry at all in our work up to the last month. At that time the Army wrote Dettner and myself and asked us to come back and work for them awhile. Neither of us wanted to refuse under the circumstances so we stalled them for thirty days and just twenty-two days later made our first test. The Army really wanted us badly and in a hurry and it took a lot of talking to stall them.

What the Army wanted us for was to help find out about the cockroaches. That sounds funny, but it's true. It didn't make the newspapers, but about a year after the New Mexico atom bomb test, the insect problem at the testing ground suddenly increased a hundred-fold. Apparently the radiation did something to them and they came out in force one day against the control station. They finally had to dust the place with DDT to get rid of them.

Looking over the dead insects, all the government entomologists could say was that the radiation seemed to have increased their size about forty percent and made them breed faster. They never did agree whether it was the intense radiation of the blast, or the less intense, but longer continued radiation from fused sand and quartz on the ground.

New Mexico was nothing to Hiroshima and Nagasaki. After all, there are comparatively few "true bugs" in the desert and a great many in a Japanese city. About a year and a half after Japan got A-bombed, they really swarmed on both cities at the same time. They came out suddenly one night by the millions. It's been estimated that they killed and ate several hundred people before they were brought under control. To stop them, MacArthur had his entire Chemical-Warfare Service and a lot of extra units concentrated on the plague spots. They dusted with chemicals and even used some gas. At that, it was four days before the bugs were brought under control.

This time the government experts really went into the problem. They traced the insect tunnels about ten feet down and examined their breeding chambers and what not. According to their reports—all this is still kept strictly

hush-hush by the Army, but we've seen all the data—the radiation seems to drive the insects down into the earth. They stay down for awhile and breed and then seem to have a "blind urge" to go to the surface. This urge "seems to affect the entire group made up of an immense number of connected colonies at the same time." That's a quote from their report. One other thing they mentioned is that there were large breeding chambers and some sort of communal life that—to their knowledge—had not been observed in these particular insects before. We told Lasker about it and showed him the reports. He was plenty worried, but he wouldn't say why.

Don't know why I wandered so far afield. I just wanted to explain that if this test wasn't successful, we would probably have to put things off for quite a while. We were interested in the beetle problem as it not only has some interesting implications, but the effect of radiation on protoplasm is a hard nut to crack. However we had come so far on our time gadget that we wanted to finish it first. Well, we finished and tested it and now Dettner and Lasker are out fishing. As I said, they probably won't come back.

It was the day before yesterday that we made the final test. Looked at one way, we had made tremendous progress. Looked at another we had made very little. We had devised an electric field that would operate in the future. There were sixteen outlets forming the sides of a cube about four feet in diameter. When switched on, an electric field was produced which "existed" at some future time. I know Lasker would say this was incorrect, but it gets the general idea over. He would say that instead of operating in "Here-Now," it operates in "Here-Then." He'd get angry every time we'd separate "space" and "time" in our talk and tell us that we weren't living in the eighteenth century.

"Newton was a great man," he'd say, "but he's dead now. If you talk as if it were 1750, you'll *think* and *act* as if it were 1750 and then we won't get anywhere. You use non-Newtonian formulations in your work, use them in everyday speech, too."

How far in the future our gadget would operate we had no way of knowing. Lasker said he would not even attempt to estimate "when" the field was active. When the power was turned off,



anything that was in the cube of forces would be brought back to the present space-time. In other words, we had a "grab" that would reach out and drag something back from the future. Don't get the idea we were sending something into the future to bring something back with it, although that's what it amounts to for all practical purposes. We were warping space-time curvature so that anything "Here-Then" would be something "Here-Now."

We finished the gadget at three a.m. Tuesday morning. Lasker had been sleeping on the couch while we worked on it. He had checked and rechecked his formulae and said that if we could produce the fields he'd specified, it would probably work. We tested each output separately and then woke him up. I can't tell you how excited we were as we stood there with everything ready. Finally Dettner said, "Let's get it done," and I pressed the start button.

The needles on our ammeters flashed over and back, the machine went dead as the circuit breakers came open, and there was an object in the cube.

We looked it over from all sides without touching it. Then the implications of it began to hit us. It's funny what men will do at a time like that. Dettner took out his watch, examined it carefully, as if he had never seen it before, and then went over and turned on the electric

percolator. Lasker swore quietly in Spanish or Portuguese, I'm not sure which. I sat down and began a letter to my wife. I got as far as writing the date and then tore it up.

What was in the cube—it's still there, none of us have touched it—was a small statue about three feet high. It's some sort of metal that looks like silver. About half the height is pedestal and half is the statue itself. It's done in great detail and obviously by a skilled artist. The pedestal consists of a globe of the Earth with the continents and islands in relief. So far as I can determine it's pretty accurate, although I think the continents are a little different shape on most maps. But I may be wrong. The figure on top is standing up very straight and looking upwards. It's dressed only in a wide belt from which a pouch hangs on one side and a flat square box on the other. It looks intelligent and is obviously representing either aspiration or a religious theme, or maybe both. You can sense the dreams and ideals of the figure and the obvious sympathy and understanding of the artist with them. Lasker says he thinks the statue is an expression of religious feeling. Dettner and I both think it represents aspirations: *Per ardua ad astra* or something of the sort. It's a majestic figure and it's easy to respond to it emphatically with a sort of "upward and onward" feeling. There is only one thing wrong. The figure is that of a beetle.

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# LOGIC

By POUL ANDERSON

*Man can think, but there is no evidence whatever  
that man's way of thinking is the way to think!*

*Brother bringeth  
brother his bane,  
and sons of sisters  
break kinship's bonds.  
Never a man  
spareth another.  
Hard is the world.  
Whoredom prevaieth.  
Axe-time, sword-time,  
—shields are cloven—  
wind-time and wolf-time  
ere the world waneth.*

—ELDER EDDA.

He was nearly always alone, and even when others were near him, even when he was speaking with them, he seemed to be standing on the far side of an unbridgeable gulf. His only companion was a gaunt gray mongrel with a curiously shaped head and a savage disposition, and the two had traveled far over the empty countryside, the rolling plains and straggling woods and high bluffs several miles down the river. They were an uncanny sight, walking along a ridge against the blood-flaring sunset, the thin, ragged, big-headed boy, like a dwarf from the legends of an irretrievable past, and the shaggy, lumpish animal skulking at his heels.

Roderick Wayne saw them thus as he walked home along the river. They were trotting rapidly along the other side. He hailed them, and they stopped, and the boy stared curiously, almost wonderingly. Wayne knew that attitude, though Alaric was only a grotesque outline against the fantastically red sky. He knew that his son was looking and looking at him, as if trying to focus, as if trying to remember who the—stranger—was. And the old pain lay deep in him, though he called out loudly enough: "Come on over, Al!"

Wayne had had a hard day's work in the shop, and he was tired. Fixing machinery was a long jump down from teaching mathematics in Southvale College, but the whole world had fallen and men survived as best they could in its ruins. He was better off than most—couldn't complain.

Of old he had been want to stroll along

the river that traversed the campus, each evening after classes, smoking his pipe and swinging his cane, thinking perhaps of what Karen would have for supper or of the stark impersonal beauty of the latest development in quantum mechanics—two topics not as unrelated as one might suppose. The quiet summer evenings were not to be spent in worry or petty plans for the next day, there was always too much time for that. He simply walked along in his loose-jointed way, breathing tobacco smoke and the cool still air, watching the tall old trees mirror themselves in the river or the molten gold and copper of sunset. There would be a few students on the broad smooth lawns, who would hail him in a friendly way, for Bugsy Wayne was well liked; otherwise only the river and himself and the evening star.

But that was sixteen or more years ago, and his memories of that time were dim by now, blurred in a tidal wave of savage, resistless events. The brief, the incredible nightmare of a war that wiped out every important city in the world in a couple of months—its protracted aftermath of disease, starvation, battle, work, woe, and the twisting of human destiny—it covered those earlier experiences, distorted them like rocks seen through a flowing stream. Now the campus stood in ruinous desolation, cattle staked out in the long grass, crumbling empty buildings staring with blind eyes at the shards of civilization.

After the cities went, and the deliberately spread diseases and blights shattered the world's culture into fratricidal savages fighting for the scraps, there was no more need of professors but a desperate shortage of mechanics and technicians. Southvale, by-passed by war, a college town in the agricultural Midwest, drew into itself a tight communistic dictatorship defending what it had with blood and death. It was cruel, that no-admission policy. There had been open battles with wandering starvelings. But the plagues were kept out, and they had saved enough food for most of them to survive even that first terrible winter after the war-strewn blights and insects had devoured the

crops. But farm machinery had to be kept going. It had to be converted to horse, ox, and human power when gasoline gave out. So Wayne was assigned to the machine shop and, somewhat to his own surprise, turned out to be an excellent technician. His talents for robbing now useless tractors and automobiles in search of spare parts for the literally priceless food machines got his nickname changed to Cannibal, and he rose to general superintendent.

That was a long time ago, and conditions had improved since. The dictatorship was relaxed now, but Southvale still didn't need professors, and it had enough elementary teachers for its waning child population. So Wayne was still machine shop boss. In spite of which, he was only a very tired man in patched and greasy overalls, going home to supper, and his thoughts darkened as he saw his child.

Alaric Wayne crossed the ruinous bridge a few yards upriver and joined his father. They were an odd contrast, the man tall and stooped with grayed hair and a long, lined face; the boy small for his fourteen years, lean and ragged, his frail-looking body too short for his long legs, his head too big for both. Under ruffled brown hair his face was thin, almost intense in its straight-lined, delicately cut pensiveness, but his huge light-blue eyes were vacant and unfocused.

"Where've you been all day, son?" asked Wayne. He didn't really expect an answer, and got none. Alaric rarely spoke, didn't even seem to hear most questions. He was looking blankly ahead now, like a blind creature, but for all his gawky appearance moved with a certain grace.

Wayne's glance held only pity, his mind only an infinite weariness. *And this is the future. The war, loading air and earth with radioactive colloids, dust, which won't burn out for a century. Not enough radioactivity to be lethal to any but highly susceptible individuals—but enough to saturate our organisms and environment, enough to start an explosion of mutations in every living creature. This was man's decision, to sell his birthright, his racial existence, for the sovereign prerogatives of nations existing today only in name and memory. And what will come of it, nobody can know.*

They walked up the hill and onto the street. Grass had grown between paving blocks, and tumble-down houses stood vacantly in weed-covered lots. A little

farther on, though, they came into the district still inhabited. The population had fallen to about half the prewar, through privation and battle as well as causes which had once been more usual. At first glance, Southvale had a human, almost medieval look. A horsedrawn wagon creaked by. Folk went down toward the market place in rude homespun clothes, carrying torches and clumsy lanterns. Candlelight shone warmly through the windows of tenanted houses.

Then one saw the dogs and horses and cattle more closely—and the children. And knew what an irrevocable step had been taken, knew that man would, in a racial sense, no longer be human.

A small pack of grimy urchins raced by, normal by the old standards, normal too in their shouting spite: "Mutie! Mutie! Yaaah, mutant!" Alaric did not seem to notice them, but his dog bristled and growled. In the dusk the animal's high round head, hardly canine, seemed demoniac, and his eyes gleamed red.

Then another band of children went by, as dirty and tattered as the first, but—not human. Mutant. No two alike. A muzzled beast face. An extra finger or more, or a deficiency. Feet like toeless, horny-skinned hoofs. Twisted skeletons, grotesque limping gait. Pattering dwarfs. Acromegalic giants, seven feet tall at twelve years of age. A bearded six-year-old. Things even worse—

Not all were obviously deformed. Most mutations were, of course, unfavorable, but none in that group were cripplingly handicapped. Several looked entirely normal, and their internal differences had been discovered more or less accidentally. Probably many of the "human" children had some such variation, unsuspected, or a latent mutation that would show up later. Nor were all the deviations deformities. Extremely long legs or an abnormally high metabolism, for instance, had advantages as well as disadvantages.

Those were the two kinds of children in Southvale and, by report, the world. A third pitiful group hardly counted, that of hopelessly crippled mutants, born with some handicap of mind or body which usually killed them in a few years.

At first, the tide of abnormal births following the war had brought only horror and despair. Infanticide had run rampant, but today there were asylums

for unwanted children. People knew their child had about three chances in four of being mutant to a greater or less degree—but, after all, there *could* be a human, if not this time then next—or even a genuinely favorable mutant.

But Wayne had not seen or heard of any such, and doubted that he ever would. There were so many ways of not doing something, and even an unquestionably good characteristic seemed to involve some loss elsewhere. Like the Martin kid, with his eagle-keen eyes and total deafness.

He waved to that boy, running along with the mutant band, and got an answer. The rest ignored him. Mutants were shy of humans, often resentful and suspicious. And one could hardly blame them. This first generation had been hounded unmercifully by the normal children as it grew up, and had had to endure a lot of abuse and discrimination on the part of adults. No wonder they drew together, and said little to anyone except their fellows. Today, with most of their persecutors grown up, the mutants were a majority among the children, but they still had nothing to do with humans of their generation beyond a few fights. The older ones generally realized that they would inherit the earth, and were content to wait. Old age and death were their allies.

But Alaric—The old uncertain pain stirred in Wayne. He didn't know. Certainly the boy was a mutant; an X-ray, taken when the town machine had recently been put back into service, had shown his internal organs to be reversed in position. And apparently the mutation involved moronic traits, for he spoke so little and so poorly, had flunked out of elementary school, and seemed wholly remote from the world outside him. But—well, the kid read omnivorously, and at tremendous speed if he wasn't just idly turning pages. He tinkered with apparatus Wayne had salvaged from the abandoned college labs, though there seemed to be no particular purpose to his actions. And every now and then he made some remark which might be queerly significant—unless, of course, that was only his parents' wishful thinking.

Well, Alaric was all they had now. Little Ike, born before the war, had died of hunger the first winter. Since Al's birth they'd had no more children. The radioactivity seemed to have a slow sterilizing effect on many people.

Karen met them at the door. The mere sight of her blonde vivacity lifted

Wayne's spirits. "Hello, gentlemen," she said. "Guess what?"

"I wouldn't know," answered Wayne.

"Government jet was here today. We're going to get regular air service."

"No kidding!"

"Honest Injun. I have it straight from the pilot, a colonel no less. I was down by the port, on the way to market, about noon, when it landed, and of course forced my way into the conversation."

"You wouldn't have to," said Wayne admiringly.

"Flatterer! Anyway, he was informing the mayor officially, and a few passers-by like myself threw in their two bits' worth."

"Hm-m-m." Wayne entered the house. "Of course, I knew the government was starting an airline, but I never thought we'd get a place on it even if we do have a cleared area euphemistically termed an airport."

"Anyway, think of it. We'll get clothes, fuel, machinery, food—no, I suppose we'll be shipping that ourselves. Apropos which, soup's on."

It was a good meal, plain ingredients but imaginative preparation. Wayne attacked it vigorously, but his mind was restless. "Funny," he mused, "how our culture overreached itself. It grew top-heavy and collapsed in a war so great we had to start almost over again. But we had some machines and enough knowledge to rebuild without too many intervening steps. Our railroads and highways, for instance, are gone, but now we're replacing them with a national airline. We'll likewise go later directly from foot and horseback to private planes."

"And we won't be isolated any more, contacting the outside maybe four times a year. We'll be part of the world again."

"Mm-m-m—what's left of it, and that isn't much. Europe and most of Asia, they tell me, are too far gone to make intercourse worthwhile or even possible. The southern parts of this country and the greater part of Latin America are still pretty savage. Most people who survived the war migrated there later, to escape cold and hunger. Result—overcrowding, more famine, fighting and general lawlessness. Those who stuck it out here in the north and stayed alive came out better in the end."

"It'll be a curious new culture," said Karen thoughtfully. "Scattered towns and villages, connected by airlines so fast that cities probably won't need to grow up again. Stretches of wild country between, and—well, it'll be strange."



"Certainly that. But we can hardly extrapolate at this stage of the game. Look, we here in Southvale, and a lot of similarly circumstanced places, have been able to relax for some ten years now. Blights and bugs and plagues pretty well licked, outlaws rounded up or gone into remote areas—Well, we've been back on our feet that long. Since then, the process of re-integrating the country has gone ahead pretty steadily. We're no longer isolated, as you said. With the government center in Oregon as a sort of central exchange, we've been able to trade some of the things we have for what we need, and now this regular airline service will be the way to a national economy. Martial law was . . . ah . . . undeclared nine years ago, and the formal unification of the United States, Canada, and Alaska carried out then. You and I helped elect Drummond to President last time, when the poll plane came around."

"I know a little of that already, O omniscient one. What is all this leading up to?"

"Simply that in spite of all which has been accomplished, there's still a long ways to go. South of us is anarchic barbarism. We have precarious contact with some towns in Latin America, Russia, China, Australia, and South Africa, otherwise we're an island of, shall I say, civilization in a planetary sea of savagery and desolation. What will come of that? Or still more important—what will come of the mutants?"

Karen's eyes were haggard as they searched Alaric's unheeding face. "Perhaps at last—the superman," she whispered.

"Not at all probable, dear. You read the official book explaining this thing. Since most mutations are recessive, though they do tend to follow certain patterns, there must have been an incredible totality of altered genes for so many to find their mates and show up in the first generation. Even after the radioactivity is gone, there'll be all those unmatched genes, waiting for a complement to become manifest. For several centuries, there'll be no way to tell what sort of children any couple will have, unless the geneticists figure out some system we don't even suspect at present. Even then, the mutated genes would still be there; we couldn't do anything about that. God only knows what the end result will be—but it won't be human."

"There may be other senses of that word."

"There will be, inevitably. But they won't be today's."

"Still—if all the favorable characteristics showed up in one individual, he'd be a superman."

"You assume no unfavorable ones, possibly linked, will appear. And the odds against it are unguessable. Anyway, what is a superman? Is he a bulletproof organism of a thousand horsepower? Is he a macrocephalic dwarf talking in calculus? I suppose you mean a godlike being, a greatly refined and improved human. I grant you, a few minor changes in human physique would be desirable though not at all necessary. But any semanticist will tell you *Homo sapiens* is a million miles from realizing his full mental capacities. He needs training right now, not evolution."

"In any case," finished Wayne grayly, "we're arguing a dead issue. *Homo sapiens* has committed race suicide. The mutants will be man."

"Yes—I suppose so. What do you think of the steak?"

Wayne settled down in his easy-chair after supper. Tobacco and newspapers were not being produced, and the government was still taking all the radios made in its new or revived factories. But he had a vast library, his own books and those he had salvaged from the college, and most of them were timeless. He opened a well-thumbed little volume and glanced at lines he knew by heart.

"For a' that an' a' that,  
It's comin' yet for a' that,  
When men to men, the whole  
world o'er,  
Shall brothers be for a' that."

*I wonder. How often I've wondered!  
And even if Burns was right, will the  
plowman's common sense apply to non-  
humanity? Let's see what another has  
to say—*

"And we, that now make merry in the  
Room  
They left, and Summer dresses in new  
bloom,  
Ourselves must we beneath the Couch  
of Earth  
Descend—ourselves to make a Couch—  
—for whom?"

His gaze descended to Alaric. The boy sprawled on the floor in a litter of open books. His eyes darted from one to another, skipping crazily, their blankness become a weird blue flicker. The books—"Theory of Functions," "Nuclear

Mechanics," "Handbooks of Chemistry and Physics," "Principles of Psychology," "Rocket Engineering," "Biochemistry." None of it could be skimmed through, or alternated that way. The greatest genius of history couldn't do it. And a senseless jumble like that—No, Alaric was just turning pages. He must be—a moron?

*Well, I'm tired. Might as well go to bed. Tomorrow's Sunday—good thing we can take holidays again, and sleep late.*

There were a good fifty men in Richard Hammer's gang, and about ten women equally gaunt and furtive and dangerous. They moved slowly along the riverbank, cursing the rocks they stumbled on, but in a ferocious whisper. Overhead a half moon gave vague light from a cloudy sky. The river sped on its way, moonlight shimmering fitfully off its darkness, and an uncertain wind ghosted through soughing trees. Somewhere a dog howled, and a wild cow bellowed alarm for her calf—descendants of domestic animals that ran free when their masters fled or died. And most savage of all the creatures moving through that night were the humans who had likewise been thrust back into wilderness.

"Dick! How much longer, Dick?"

Hammer turned at the low call and scowled back at the uncertain shapes of his followers. "Shut up," he growled. "No talkin' on march."

"I'll talk when I please." The voice was louder.

Hammer hunched his great shoulders and thrust his battered hairy face aggressively into the moonlight. "I'm still boss," he said quietly. "Anytime you wanta fight me for the job, go ahead."

He had their only remaining firearm, a rifle slung over his back and a belt of a few cartridges, but with knife and club, fists and feet and teeth he was also the deadliest battler in the gang. That was all which had kept him alive, those unending dreadful years of feud and famine and hopeless drifting, for no gangman was ever safe and a boss, with his own jealous subordinates to watch as well as outsiders, least of all.

"O.K., O.K.," yielded the other man sullenly. "Only I'm tired an' hungry, we been 'not much' so long—"

"Not much farther," promised Hammer. "I rec'nize this territory. Come on—an' quiet!"

They moved ahead, stumbling, half asleep with weariness, and the terrible gnawing void in their bellies was all that

kept them going. It had ben a long journey, hundreds of miles of devastated southland, and it was hard, bitterly hard, to pass these comparatively rich farms without lifting more than a few chickens or ears of corn. But Hammer was insistent on secrecy, and he had dominated them long enough for most of them to give in more or less automatically. He had not yet chosen to reveal his plans, but this far into "enemy" country they must involve fighting.

The moon was lowering when Hammer called a halt. They had topped a high ridge overlooking a darker mass some two miles off, a town. "You can sleep now," said the chief. "We'll attack shortly before sunrise. We'll take the place an' then—food! Houses! Women! Likker! An'—more."

The gang was too tired then to care about anything but sleep. They stretched on the ground, lank animal figures in clumsy gargents of leather and ragged homespun, carrying knives and clubs, axes, even spears and bows. Hammer squatted motionless, a great bearded gorilla of a man, his massive face turned toward the sleeping town. A pair of his lieutenants, lean young men with something hard and deadly in their impassive countenances, joined him.

"O.K., Dick, what's the idea?" muttered one. "We don't just go tearin' in; if that was all, there're towns closer to where we came from. What're you cookin' now?"

"Plenty," said Hammer. "Now don't get noisy, an' I'll explain. My notion'll give us more'n a few days' food an' rest an' celebration. It'll give us—home."

"Home!" whispered the other outlaw. His cold eyes took on an odd remote look. "Home! The word tastes queer. I ain't spoke it so long—"

"I useta live here, before the war," said Hammer softly and tonelessly. "When things blew up, though, I was in the army. The plagues hit my unit, an' those who didn't die the first week went over the hill. I headed south, figgerin' the country'd busted up an' I'd better go where it'd be warm. Only too many other people got the same idea."

"You've told us that much before."

"I know, I know, but—anybody who lived through it can't forget it. I still see those men dyin'—the plague eatin' 'em. Well, we fought for food. Separate gangs attacked when they met. Until at last there were few enough left an' things picked up a little. So I jined the village an' tried farmin'."

The dog howled again, closer. There was an eerie quavering in that cry, something never voiced before the mutations began. "That mutt," growled one of the gangmen, "will wake the whole muckin' town."

"Nah, this place has been peaceful too long," said Hammer. "You can see that. No guards nowhere. Why, there're sep'rate farms. We had to fight other men, an' then when we finally settled down it was the bugs an' blights, an' at last the floods washed our land from under us an' we had to take to gang life again. Then I remembered my ol' home town Southvale. Nice farmin' land, not too bad weather, an' judgin' by reports an' rumors about this region, settled down, a'most rich. So I thought I'd come back—" Hammer's teeth gleamed white under the moon.

"Well, you always did love t'hear y'rself talk. Now suppose you say what your deal is."

"Just this. The town's cut off from outside by ordinary means. Once we hold it, we can easy take care o' the outlyin' farms an' villages. But—you can see the gov'-ments's been here. Few bugs in the crops, so somebody must'a been sprayin'. A jet overhead yesterday. An' so on."

They stirred uneasily. One muttered, "We don't want no truck with the gov'-ment. They'll hang us f'r this."

"If they can! They're really not so strong. They ain't got aroun' to the South at all, 'cept f'r one or two visits. Way I figger it there's only one gov'ment center to speak of, this town out in Oregon we heard about. We can find out 'zac'ly from the people we catch. They'll tell!

"Now look. The gov'ment must deal with Southvale, one way 'r 'nother. There ain't enough cars 'r roads, they must use planes. That means one'll land in Southvale, sooner 'r later. The pilot steps out—an' we've got us a plane. I ain't forgot how to fly. A few o' us 'r maybe we can ferry a lot, fly to Oregon an' land at night near the house o' some big shot, the President even, whoever he is. The plane's pilot'll tell us what we need to know. Those jets just whisper along, an' anyway nobody expects air attack any more. We'll be just another incomin' plane if they do spot us.

"We capture our big shot, an' find out from him where the atom bombs're kept. There must be some stockpiled near the city, an' our man'll make a front f'r us to get at 'em. If he ain't scared f'r him-

self, he's got a family. We set the bombs an' clear out. The city blows. No more gov'ment worth mentionin'. With what we've taken from the arsenals, we'll hold Southvale an' all this territory. We'll be bosses, owners—kings! Maybe later we c'n go on an' conquer more land. There'll be no gov'ment t' stop us."

He stood up. His eyes caught the moonlight in a darkly splendid vision of power and destiny, for he was not, in his own estimate, a robber. Hardened by pain and sorrow and the long bitter fight to stay alive, he was more of a conqueror, with the grandiose dreams and at least something of the driving energy and transcendent genius of an Alexander or a Napoleon. He genuinely hoped to improve the lot of his own people, and as for others—well, "stranger" and "enemy" had been synonymous too long for him to give that side of it much thought now.

"No more hunger," he breathed. "No more cold an' wet, no more hidin' an' runnin' from a stronger gang, no more walkin' an' walkin' an' never gettin' nowhere. Our kids won't die before they're weaned, they'll grow up as God meant they should, free an' happy an' safe. We c'n build our own future, boys—I seem t' see it now, a tall city reachin' f'r the sun."

His lieutenants stirred uneasily. After some ten years of association they recognized their chief's strange moods but could not fathom them. His enormous ambitions were beyond the scope of minds focused purely on the daily struggle for life, they were awed and half afraid. But even his legion of enemies and rivals acknowledged Hammer's skill and audacity and luck. This might work.

Their own ideas of a future went little beyond a house and a harem. But to smash the government was a cause worth giving life for. They associated it with the disaster, and thus with all their woes. And it was their enemy. It would kill them, or at least lock them up, for deeds done when life depended on ruthless action. It would certainly never permit them to hold this green and lovely land.

Unless—unless!

The dog had been snuffing around the outlaw camp, a vague misshapen shadow in the fleeting moonlight. Now he howled once more and trotted down the ridge toward the dark silent mass of the town.

Alaric Wayne woke up at the sound of scratching. For a moment he lay in

bed, mind still clouded with sleep. Moonlight streamed through the window to shimmer off the tumbled heaps of books and apparatus littering the room. Outside, the world was a black and white fantasy of bulking shadow, dreaming off into the remote star-torched sky.

Full wakefulness came. Alaric slid out of bed, went to the window, and leaned against the screen. It was his dog, scratching to get in. And—excited. He raised the screen and the animal jumped clumsily over the sill.

The dog whined, pulled at Alaric's leg, sniffed toward the south and shivered. The boy's great light eyes seemed to deepen and brighten, flash cold in the pouring moonlight; shadow-masked, his thin face was not discernible, but its habitual blankness slid into tight lines.

The dog was warning him of danger from the south. But, though the mutation shaping the canine brain had given it abnormal intelligence, he was still a dog, not qualitatively different from the rest of his species, not able to understand or reason above an elementary level. Three years before, Alaric had spotted qualities in the pup by certain signs, and raised and trained it, and there was a curious half-rapport between them, a mutual understanding. They had co-operated earlier, on their long hikes, to hunt or to avoid the wild dog packs, but now—

There was danger. Men outside town, to the south, with hostile intentions. That was all the dog had been able to gather. It would have been enough for any normal human, as a basis of action. But Alaric wasn't normal.

He stood shivering with effort, clenching his hands to his forehead as if to prevent a physical disintegration of his frantically groping brain. What did it mean? What to do?

Danger—danger was clear enough, and primitive instinct revealed the action one must take. One ran from the packs of human boys when they intended to commit mayhem on a mutant, and hid. One skirted the spoor of wild dogs or the bears beginning to spread since hunting fell off. Only in this case—slowly, reluctantly, fighting itself, his shuddering mind spewed out the conclusion—in this case, one couldn't run. If the town went, so did all safety.

Think—*think!* There was danger, it couldn't be run from—what to do? His mind groped in fog and chaos. It could grasp at nothing. Disjointed logic chains clanked insanely in his skull.

Reason did not supply the answer, but

instinct came, the instinct which would have surged to the fore under the pressure of immediate peril, and now finally broke through the swirling storm of a mind trying to think.

Why—it was so simple. Alaric relaxed, eyes widening with the sheer delightful simplicity of it. It was, really, as obvious as—why, it had all the primitive elementariness of the three-body problem. If you couldn't run from danger—you fought it!

Fighting—destruction—yes, something to destroy, but he would only have the newly reclaimed powerhouse available—

He scrambled into his clothes with frantic speed. A glance at stars and moon told him, without his thinking about it, how long to sunrise. Not long—and in his own way he knew the enemy would attack just before dawn. He had to hurry!

He vaulted out the window and ran down the silent street, the dog following. All the town's electrical and electronic equipment was stored at the powerhouse. It would be quite a while before the whole community had electricity again, but meanwhile the plant ran several important machines, charged storage batteries, and performed other essential services.

The building stood beside the river, the only lit windows in town besides the police station glowing from its dark bulk. After the war there had been no time, supplies, or parts to spare for the generators, and they had been plundered to repair the vital farm equipment, but recently the government had delivered what was necessary to get the water turbines going again. It had occasioned a formal celebration in Southvale—another step up the ladder, after that long fall down.

Alaric beat on the door, yelling wordlessly. There came the sound of a scraping chair and the maddeningly slow shuffle of feet. Alaric jittered on the steps, gasping. No time, no time!

The door creaked open and the night watchman blinked myopically at Alaric. He was an old man, and hadn't gotten new glasses since the war. "Who're you?" he asked. "And what do you want at this hour?"

Alaric brushed by unheedingly and made for the storeroom. He knew what he needed and what he must do with it, but the job was long and time was growing so desperately short.

"Here . . . hey, you!" The watchman hobbled after him, shaking with indigna-



tion. "You crazy mutie, what do you think you're doing—?"

Alaric shook loose the clutching hand and gestured to his dog. The mongrel snarled and bristled, and the watchman stumbled back, whitefaced. "Help!" It was a high, old man's yell. "Help, burglar—"

Somehow words came, more instinctive than reasoned. "Shut up," said Alaric, "or dog kill you." He meant it.

The animal added emphasis with a bass growl and a vicious snap of fangs. His head reeling, his heart seeming to burst his ribs, the watchman sank into a chair and the dog sat down to watch him.

The storeroom door was locked. Alaric grabbed a heavy wrench and beat down a panel. Tumbling into the storeroom, he grabbed for what he needed. Wire—meters—electronic tubes—batteries—*hurry, hurry!*

Dragging it out into the main room before the great droning generators, he squatted down, a tatterdemalion gnome, eyes like blued metal, face tautened into a savagery of concentration, and got to work. Through a visual blur, the guard stared in uncomprehending terror. The dog watched him steadily, with sullen, malevolent hope that he would try something. It was embittering, to hate all the world save one being, because only that being understood—

False dawn glimmered wanly over the land, touching houses and fields with wandering ghost fingers, glittering briefly off the swift-flowing river before deeper darkness returned. Hammer's gang woke with the instant animal alertness of their kind, and stirred in the fog-drifting twilight. Their scant clothes were heavy with dew, they were cold and hungry—how hungry!—and they looked down at the moveless mass of their goal with smoldering savage yearning.

"Fair is the land," whispered Hammer, "more fair 'n land's ever been. The fields 're green t' harvest an' the fog runs white over a river like a polished knife—an' it's our land, our home." His voice rose in hard snapping command: "Joe, take twenty men an' circle north. Come in by the main road, postin' men at the edge o' town an' the bridge over the river, then wait in the main square. Buck, take your fifteen, circle west, an' come in the same time as Joe, postin' men outside town an' in that big buildin' halfway down Fifth Street—that's the machine shop, as I recall, an' I *hope* you c'n still read street signs. Then join

Joe. The rest follow me straight no'th. Go as quiet as you can, slug 'r kill anyone you meet, an' be ready f'r a fight but don't start one. O.K.!"

The two other groups filed down the hill and vanished into misty dusk. Hammer waited awhile. He had previously divided the gang into bands assigned to his lieutenants, reserving the best men for the group immediately under him. He spoke to them, softly but with metallic rapidity:

"Accordin' t' what I remember o' Southvale, an' to what I seen elsewhere, they don't expect nothin' like this. There've been no bandits here f'r a long time, an' anyway they'd never think a gang had the skill and self-control t' sneak through the fat lands farther south. So there'll be no patrol, just a few cops on their beats—an' too sleepy this time t' give us much trouble. An' nearly all the weapons 're gonna be in the police station—which is what we're gonna capture. With guns, we'll control the town. But f'r the love of life, don't start shootin' till I say so. There may be armed citizens, an' they c'n raise hell with us 'nless we handle 'em right."

A low mutter of assent ran along that line of haggard, bearded, fierce-eyed men. Knives and axes glittered in the first dim dawn-flush, bows were strung and spears hefted. But there was no restlessness, no uncontrollable lust to be off and into battle. They had learned patience the hard way, the last sixteen years. They waited.

Timing wasn't easy to judge, but Hammer had developed a sense for it which had enabled him to pull several coups in the past and served him now. When he figured the other groups were near the outskirts of town, he raised his hand in signal, slipped the safety catch on his gun, and started down the hill at a rapid trot.

The white mists rolled over the ground, but they needed nothing to muffle the soft pad of their feet, most bare and all trained in quietness. Grass whispered under their pace, a staked-out cow lowed, and a rooster greeted the first banners of day. Otherwise there was silence, and the town dreamed on in the cool twilight.

They came onto the cracked pavement of the road, and it was strange to be going on concrete again. They passed an outer zone of deserted houses. As Hammer had noticed elsewhere, Southvale had drawn into a compact defensive mass during the black years and not

grown out of it since. As long as there were no fortified outposts, such an arrangement was easy to overrun. Still, the outlaws were enormously outnumbered, and had to counterbalance the disadvantage by the cold ruthlessness of direct action. Hammer stopped at the edge of habitation, told off half a dozen men to patrol the area, and led the rest on to the middle of town. They went more slowly now, senses straining alert, every nerve and muscle taut with the expectancy of danger.

Hoofs clattered from a side street. Hammer gestured to a bowman, who grinned and bent his weapon. A mounted policeman came into view a few blocks down. He wasn't impressive, he had no sign of office except gun and tarnished badge, he was sleepy and eager to report to the station and then get home. His wife would have breakfast ready—

The bow twanged, a great bass throb of music in the silent misty street. The policeman pitched out of his saddle, the arrow through his breast, the astonishment on his face so ridiculous that a couple of gangmen guffawed. Hammer cursed; the horse had reared, screamed, and then galloped on down the street. The clattering echoes beat at the walls of the house like alarm-crying sentries.

A man stuck his head out the window of a dwelling. He was drowsy, but he saw the unkempt band outside and yelled—a choked gurgle it was, drowned in an arrow's blood-track before it had been properly born.

"Snagtooth an' Mex, get in that house an' silence anyone else!" rapped Hammer. "You five"—he swept an arm in an unconsciously imperial gesture—"take care o' anyone else here who heard. The rest come on!"

They ran down the street, disregarding noise but not making much anyway. The town had changed considerably, but Hammer remembered the layout. The police station, he thought briefly and wryly, he knew very well—just about every Saturday night, in the old days.

They burst onto that block and raced for the station. There it was, the same square and solid structure, dingy now with years, the trimmings gone, but there were horses hitched before it and the door stood ajar—

Through the door! The desk sergeant and a couple of men gaped blankly down the muzzle of Hammer's gun, their minds refusing to comprehend, their hands rising by stunned automatism.

Others of the gang poured down the short halls, into every room. There came yells, the clatter of feet, the brief sharp bark of a gun and the racket of combat.

Hoofs pounded outside. A gun cracked, and one of Hammer's men, standing guard at the door, fell. Hammer himself jumped to the window, smashed the glass of it with his rifle butt, and shot at the half-dozen or so mounted police outside—returning from their beats, no doubt, and alarmed at what they saw.

He had little opportunity to practice. Shells were too scarce. His first shot went wild, the second hit a horse, the third was as ineffectual as the first. But the police did retreat. They weren't such good shots either, though a couple of slugs whined viciously close, through the window and thudding into the wall beyond.

"Here, Dick!" His men were returning from the interior of the building, and they bore firearms, bore them as they would something holy and infinitely beautiful, for these were the way to a life worth living. "Here—shootin' weapons!"

Hammer grabbed a submachine-gun and cut loose. The troopers scattered, leaving their dead, and fled down the streets. And there were those other two bands entering—Hammer laughed for sheer joy.

"We got the whole station," reported one of his men. "Bob got it in the leg, an' I see they plugged Little Jack an' Tony. But the place is ours!"

"Yeah. Lock up these cops, take what weapons an' horses you need, an' ride aroun' town. Herd ever'body down into the main square in the center o' town. Be careful, there'll be some trouble an' killin', but we don't have to be on the receivin' end o' any o' it. Mart, Rog, an' One-Ear, hold the station here an' look after our wounded, Sambo an' Putzy, follow me. I'm goin' t' the square now to—take possession!"

There was noise in the street, running and stamping feet, shouts and oaths and screams. Now and then laughter or gunfire. Roderick Wayne gasped out of sleep, sweating. What a dream! Nightmare recollection of the black years—

*No dream!*

There was a tremendous kicking and beating on the door, and a voice bawling in some uncouth accent: "Open up in there! Open up in the name o' the law!"

More laughter, like wolves baying. Someone yelling. A cry that choked off in silence. Wayne jumped out of bed. Even then he was dimly surprised to find he wasn't shaking and gibbering in blind panic. "Get Al, Karen," he said. "Stay inside, in a back room. I've got to look into this."

He stopped in the living room to get his rifle. It was only a souvenir now, few cartridges left, but he had killed men with it in the black years. *And must I go through that again? No—please not!*

Wood split and crashed, and a man leaped into the house over the fallen door. Wayne saw the pistol and dropped his own unloaded rifle. He remembered such ragged figures, the shaggy wolf-eyed men whose weapons were all too ready. The outlaws had returned.

"Smart," nodded the gangman. "Nother sec 'n' I'd'a scragged you. Outside."

"What . . . is . . . this?" Wayne's lips were stiff.

"Get out!"

Wayne went obliquely, praying he could draw the bandit out of the house. "If it's loot you want," he said, fighting to keep his voice level, "I'll show you where the silver is."

Another gangman entered. He had abandoned his unaccustomed gun for his old ax. "Ever'body out o' here?" he asked.

"I just got in," said the first. "I'll search it myself. Find y'r own house." He turned to Wayne and slammed him in the stomach with one fist, "Scram, you—down t' the main square!"

Retching, Wayne staggered back, and outside mostly by chance. Sick and dizzy, head roaring like his collapsing world, he leaned against the wall.

"Rod!"

He turned, unbelieving. Karen had just come around the side of the house, pale but outwardly composed. "Are you all right, Rod?" she whispered.

"Yeah . . . yeah . . . but you . . . how—"

"I heard them talking and slipped out a window. But Rod—Al's gone."

"Gone!" Briefly, new dismay shook Wayne. Al—whatever the mutant was, Al was his son. Then relief came, realization. "He must have sneaked out, too. He's all right. He knows how to run and hide—all mutant kids learn that." His mind added grayly: *And in the next generation all human kids will have to learn it.*

"But us—Rod, what is this?"

Wayne shrugged and started down the street. "Town's apparently captured," he said.

"Outlaws—we have to run, Rod! Have to get away!"

"Not much use, I'm afraid. This is the work of a well-disciplined group under a smart leader. They must have come up from the south, resisting the temptation to plunder on the way. They took us by complete flat-footed surprise, overpowered the police—I recognized Ed Haley's pistol in that bandit's hand—and are now rounding us up in quite a methodical fashion. I wasn't just shoved out. I was ordered to report to the square. That suggests they're guarding all ways out. Anyway, we can't flee right now."

They had fallen in with a group of citizens moving with the dumb blank obedience of stunned minds toward the square under outlaw guard. The gang was having little trouble. They went from house to house, forcing the inhabitants into the street. The work went fast.

There was fighting now and then, short and sharp, ending in blow of club or knife or bullet. A couple of families with guns stood off the invaders. Wayne saw fire arrows shot in the roofs of those houses.

He shuddered and bent his head to Karen's ear. "We do have to get out as soon as we can," he muttered. "If we can. They're disciplined now, and wholly merciless. Once we're completely rounded up, the discipline will break but the ruthlessness stay in such an orgy of looting and drinking, burning and rape and murder, as has always followed barbarian conquests."

"They can't stay long," she answered desperately. "The government . . . this is on the air route—"

"That's what I can't figure out. They must know they can't remain, so why did they come here in the first place? Why not raid the lands closer to home? Well—we'll have to see, that's all."

The—herd—of citizens entered the square and walked toward the little memorial in its center with the queer blind shuffle that cattle in a stockyard chute have. There were other outlaw guards posted around the square and on the memorial, weapons ready. The monument was a granite shaft with a stone bench on each side, and seated there—

Wayne did not remember the bearded giant, but Karen caught a sudden gasp of recognition. "It . . . it . . . Rod, it's Hammer. Richard Hammer!"

"Eh?"

"Don't you recall—the mechanic at the service station—we always used to get our gas there, and once when I smashed a fender on the car he fixed it so you wouldn't notice—"

The chief heard them. There weren't many people in the square yet, and the early sun struck dazzling off Karen's hair. "Why, it's Miz' Wayne," he said. "Howdy Miz' Wayne."

"H-h-hello," faltered Karen.

"Lookin' purtier 'n ever, too. Wayne, you had all the luck."

The mathematician shouldered his way forward, suddenly weak with a dreadful clawing fear. "Hammer—what is this?" he got out.

"I'm takin' over Southvale. Meet y'r new boss."

"You—" Wayne swallowed. He choked down the panic rising in him and said in a level, toneless voice: "I gather you've become chief of this band and led it back here for a raid. But—you must know you can't get away with it. We're on an airline route. The government will know."

Hammer smiled wearily. "I've figured all that out. I intend to stay here. I'm gatherin' all the folks t' tell 'em t' be good, because we don't mind killin'. But if y're really interested—" He sketched his further plans.

"You're crazy—it's not possible."

"A lot o' less possible things have happened. If you all, not too far no'th, felt safe, what about the gov'ment way out in Oregon? We'll do it!"

"But even if you can—Hammer, do you realize the government is the only link left with our past, our civilization? You'd throw man back a thousand years."

"So what? Wayne, don't you nor anybody else hand me none o' that crap 'bout law an' order an' humanity. You're fifteen years too late. You an' your kind made us outlaws, drivin' us away when we came starvin' to you, houndin' us south an' then in your fat smugness forgettin' about us. It's been hard, Wayne, battle an' death an' hunger all those years. We had t' get hard ourselves, t' stay alive."

"You could have stuck it out in the north as we did, and raised your own food free from most bandits."

"Free only because so many people like us went south. Nor were most o' us farmers, with land an' equipment an' experience. Anyway you did drive us out when you were strong. I ain't blamin'

you. You had t' live. But it's our turn now, so shut up." Hammer's eaglesque eyes swung to Karen, he smiled. It was a winter-cold smile, warmth and humor had died long ago in him. "You, I'll be seein' more of," he said. "It's been so long—"

The square was well filled with people now, and more were arriving and being herded into side streets and buildings. Some were still numb. Some wept or prayed or implored or tried to ingratiate themselves, some cursed and threatened, some retreated into impassive silence. But—prisoners all. Captured, impotent, legitimate prey.

Hammer turned as an outlaw galloped up, thrusting his horse through the crowd without regard for their safety. "What is it?" asked the chief, not anxiously. His victory was too tremendously evident.

"I dunno—some trouble down by the river," said the gangman. "About half Joe's detail ain't showed up yet."

"Hm-m-m? Musta found some likker."

"Yeah—Hey—What's that?"

Hammer turned. He couldn't see much sitting down. Huge and shaggy and ablaze with the arrogance of his triumph, he sprang lithely onto the bench and looked along the street. He grinned, then laughed, then shouted with humorless mirth. "Lamp that, boys. Some crazy mutie—look at him!"

Wayne was so placed that he could also see down that street. His heart staggered, for a black instant he couldn't believe, refused to comprehend, then—

"Alaric."

The boy was coming down the street, walking slowly and carrying an object, a fantastic wire-tangled grotesquerie of electronic surrealism, thrown together in the wildest haste and with no recognizable design. A wire led from it to a reel of cable mounted on a mule's back, and the cable snaked behind, along the road—it must go clear to the powerhouse!

How had Al done? That cable was sacrosanct, reserved for electrifying the airport. That apparatus, the invaluable parts in it—how had he gotten them? How—why? Why? What mad vagary of a reasonless brain had prompted him to go thus on this darkest of mornings? What—

"Come on, kid," shouted Hammer boisterously. "Whatcha got?"

Alaric came closer. His delicately cast features were set in concentration, his strange light eyes flashing like glacial



ice, not a human gleam. He lifted his device and twirled a pair of dials.

"May be a weapon," said a bandit uneasily and raised his rifle.

"Not Alaric—" It was a hoarse

through a whirling fog of grief and horror and hopeless defeat, saw the man's body explode.

It went up in a white burst of steam. a crash of rending bone and tissue and



cry from Wayne's throat, and he made a clumsy lunge for the outlaw. Hammer swept one long arm in a careless blow and sent him crashing to the ground.

The gangman squeezed the trigger on his rifle but never completed the motion. He was dead before that. Wayne, sprawled on his back, looking up

a brief glare of incandescence. The rifle flying from him glowed cherry red, blowing up as its cartridges detonated. Before the fragments had fallen, *something* had swept the outer edges of the square, and where the guards had stood were steam-clouded heaps of charred bone and shredded flesh.

The crowd yelled, a single beast cry half of terror, half of surging death-lusting triumph, and swept down on the remaining gangmen. Most were too demoralized to resist. Others struggled, and got a few townspeople before they were trampled under.

Hammer roared, the bellow of a pain-crazed bull, as the mob raged toward him. A horse reared as its outlaw rider was yanked from the saddle. Two slugging blows, and Hammer had cleared a way to the mount. He sprang upon its back, howling, and the attackers fell away from his insane charge.

Almost, he made it. He was on the edge of the square when a man whose brother had been killed made a long jump and grabbed the horse's bridle—grabbed it, and hung on till a dozen men held the gang boss secured.

Only one or two outlaws escaped. The rest, with the town in no mood for trials, were hanged that afternoon. Hammer asked not be blindfolded, and they granted him that much. To the end, he stood looking out over the sun-glittering river, the rolling tree-clad hills, and the fair broad land green to harvest.

Wayne took no part in the executions. He had other things to think about.

After the celebrations, the unending parades and parties and speeches, the reorganization and the defense tightening, there was a rather grim conference in Wayne's house. He and Karen were there, seated together before the fire, and Alaric sat opposite them, nervous and bewildered. A government representative was present, a lean man who looked older than he was, Robert Boyd by name and roving presidential agent by profession. In the corner, shadow-cloaked and unnoticed, squatted the shaggy troll-shape of the dog, his sullen eyes brooding redly on the others.

"You've heard the official account," said Wayne. "Alaric, a mutant *idiot savant*, invented and built a weapon to defeat the outlaws. He's been much made of, and nobody pays any attention to Pop Hanson—he's the powerhouse watchman, and was rather rudely treated. One must make allowance for the eccentricity of genius, or so they say."

"Well, one must," nodded Boyd.

"Hardly. If so many of our people hadn't died, I'd say this was a good thing. It taught us not to be complacent and careless. More important, it at least indicated that mutants can serve society

as talented members." Wayne's eyes were haggard. "Only, you see, Al didn't behave like a genius. He acted like a low-grade moron."

"Inventing that—"

"Yes, going all around Robin Hood's barn, committing violence and theft, working like a slave, risking his neck, all to build that weapon and use it. But he told me his dog warned him hours ahead of time. Certainly he was at the powerhouse early. Don't you see, we could have been ready for the outlaws, we could have stood them off, driven their ill-armed force away with no loss to us if Alaric had merely gone to the police with that warning."

Thunderstruck, Boyd swung his eyes to meet the blue vacancy of Alaric's. "Why . . . why didn't you?"

The boy stared, slowly focusing his vision and mind, face twisted with effort. He . . . his father had told him the day before . . . what was it now? Yes—"I . . . didn't . . . think of it," he fumbled.

"You didn't think of it. It just never occurred to you." Dazed, Boyd turned to Wayne. "As long as you said it yourself, I agree—*idiot savant*."

"No." Karen spoke very quietly. "No, not in any ordinary sense. Such a person is feeble-minded in all but one respect, where he is brilliant. I used to teach school, and know a little psychology. Yesterday I gave Al some special tests I'd worked out. Science, mechanical skill, comprehension—in too many respects he's a genius."

"I give up. What is he, then?"

"A mutant," said Karen.

"And . . . this weapon—?"

"Alaric tried to tell me, but we couldn't understand each other," said Wayne. "And the thing itself burned out very quickly in use. It's just fused junk now. From what I could gather, though, and by deduction on that basis, I think it projected an intense beam of an inconceivably complex wave form to which one or more important organic compounds in the body resonate. They disintegrated, releasing their binding forces. Or perhaps it was body colloids that were destroyed, releasing terrific surface energies. I'm just as glad I don't know. There are too many weapons in the world."

"Mm-m-m—officially I can't agree with you, but privately I do. Anyway, the inventor is still here—the genius."

"It takes more than genius," said

Wayne. "It just isn't possible for any human being to sit down and figure such a thing out in detail. All the facts are available, in handbooks and texts and papers—quantum mechanics, circuit characteristics, physical constants. But even if he knew exactly what he was after, the greatest genius in the world would have to spend months or years in analytical thought, then more time in putting all those facts together into the pattern he was after. And even then he wouldn't know it all. There'd be a near infinitude of small factors interacting on each other, that he couldn't allow for. He'd have to build a model and experiment with it, the empirical process known to engineers as getting the bugs out.

"In his incoherent way, Alaric told me his only difficulty was to figure out what to do to meet the danger. All he could think of was to make some kind of weapon. But he hardly spent a second working out the details of that devil's engine, and his first model was as nearly perfect as his inadequate tools and materials permitted. He *knew* how to make it."

With a shuddering effort, Boyd relaxed. He couldn't look at that small, big-headed figure in the armchair. The ancient human dread of the unknown was too strong in him. He asked slowly:

"What's the answer, then?"

"Karen and I think we've figured it out, and what little Al can tell us seems to confirm our idea. But I'll have to explain it in a roundabout way. Tell me, how does a person think?"

"Think? Why . . . well . . . by logic. He follows a logical track—"

"Exactly! A track. He thinks in chains of logic, if under that we include everything from math to emotional experience. Premise to conclusion. One thing leads to another, one at a time.

"Physics and math have been able to make their great strides because they deal, actually with the simplest concepts, which are artificially simplified still further. Newton's three laws of motion, for instance, assume that no force beyond the one set being considered is acting on a body in question; and the members of this set can be considered one at a time. We never really observe that. There is always friction, gravitation, or some other disturbing influence. Even in space there are externals. What saves physics is that these externals are usually negligibly small.

"Take a particular case. You know

the two-body problem in astronomy? Given two bodies of known mass and distance from each other, and the laws of motion and gravitation, to find their position at any past or future time. Well, it's mathematically simple. It was solved a long time ago, because there are only two interacting bodies. But the three-body problem is quite another story. Right away, with three interactions, it becomes so complex that as far as I know there's never been any general solution, and only a few special ones. As for the *n*-body problem—!"

Now in the biological sciences, including psychology and sociology, you can't simplify. You have to consider the whole. A living organism is an incredibly complex set of interactions, beginning, probably, on the subatomic level and going on up to the universal environment, from which the organism cannot be separated either, acting on and being acted on by that all the time. You *can't* apply our single-track analysis methods to such a case. The result is, of course, that those sciences are almost purely empirical, sociology hardly deserving the name. If, to use an illustration that's been used before, I want to tackle the three-body problem, I can and will start with the special case where one of them zero mass. But suppose I were making an analysis of the influence of Pan-Asiatic policies on American domestic affairs before the war. I could certainly not ignore the converse case, or the existence of other countries. I'd have to consider them all at once—which no existing math can do. Any results I got would be qualitative, nonmathematical, inexact."

"I think I see," nodded Boyd. "Of course, people can think of two or more things at once."

"That's different," said Karen. "That's a case of divided attention, each branch of the mind following its single track. It's normal enough, though carried to extremes it becomes schizophrenia."

"You get what I'm driving at," went on Wayne. "Our subhuman and human ancestors didn't need to see the world as a whole. They were only concerned with their immediate surroundings and events. So we never evolved the ability to consider an entire entity. Alaric is a mutant—"

"Some different brain structure," said Karen quietly. "The reversed internal organs may or may not be a linked characteristic. The X-rays showed no

brain difference. They hardly would, as it's probably a very subtle matter of cellular or colloidal integration."

"Al didn't have to think, in our ordinary sense of the word, of how to make a weapon," added Wayne. "His extensive knowledge of scientific principles and data co-ordinated in his mind to show him that . . . well, if my guess is right, that the colloids of human bodies are resonant to a particular wave form. And at once he knew all the factors he'd need to generate that wave. It wasn't reason, as we reason, though it was thought—to him, thought on a very elementary, almost intuitive level. Yet he wasn't able to think of telling anybody."

"I see," answered Boyd.—"Humans think in chains. *He* thinks in networks."

"Yes, that's about the size of it."

"Do you think . . . we . . . can ever do that?"

"Hm-m-m—I don't know. Since intelligence seems to depend on upbringing among normal humans, whereas genius and feeble-mindedness seem more independent of environment, and are hereditary, one might argue that they are both mutations, in the individual or an ancestor. Some people, such as Nikola Tesla, seem to have had a degree of network-thought ability, and the fact that Al is the son of a mathematician, who does deal with complexities, is suggestive. After all, no observed mutation has ever created a totally new characteristic. It would have to create a whole new set of genes for that. A mutation is a greater or less modification of an existing characteristic."

"The point I'm making is that humans naturally think in straight lines, but some sort of network, total-considering logic has been developed. The semanticists have their nonelementalistic principle. In math, we only add in special cases, the rest of the time we integrate, and we have our generalized calculi of vectors and tensors and the like. *But*—it doesn't come naturally. It's been worked out slowly and painfully, through many centuries. To Al,

it's the natural way to think; but, as like most mutations it involves a loss elsewhere, the simple straightforward logic of humans is unnatural to him and since he is just a kid, and probably not a genius anyway—merely an ordinary network thinker—he hasn't seen the principles of that logic, any more than a human his age sees the principle of nonelementalism. I'd say, offhand, that both types of mind can learn the other type of thought, but not comprehend or apply it on its higher levels."

"There's another thing," put in Karen. Her eyes held a light which hadn't been there for a long time. "Rod just said it. Al should be able, with the proper training, to learn logic, at least enough to understand and communicate. His kind of thought is not adapted to the simple problems of life, but he can be taught to handle those, as we teach human children to think in terms of abstractions. Maybe . . . maybe, then, he can teach us something."

Boyd nodded again. "It's certainly worth the attempt," he said. "We have psychiatrists and other specialists at the capital. If we'd known before that you're a mathematician, Wayne, we'd have asked you there, to join the science center with which President Drummond hopes to rebuild our culture on a basis of genuine sanity. Consider yourself invited as of now. And if we and Alaric can come to understand each other—why, Wayne, you may even get your biological and sociological math. Then we may be able to pull ourselves out of this planetary mess."

"I hope so," murmured Wayne. "I certainly hope so. And thanks, Boyd." He smiled tiredly, crookedly. "By the way, Karen, you have your superman there. The greatest genius, in his way, that he would ever saw—and if he hadn't had some kind of protective civilization to grow up in and, now, to teach him the elements of thought, he'd never have lived. I'm afraid this particular kind of superman just isn't a survivor type."

"No," whispered Karen, "not human. But he's our son."



# LITTLE LOST ROBOT

By ISAAC ASIMOV

*"Lost," as referring to a robot, is a little hard to explain. The robot knew where he was, all right—but nobody else did, and they absolutely had to find him—*

MEASURES on Hyper Base had been taken in a sort of rattling fury—the muscular equivalent of an hysterical shriek.

To itemize them in order of both chronology and desperation, they were:

1. All work on the Hyperatomic Drive through all the space volume occupied by the Stations of the Twenty-Seventh Asteroidal Grouping came to a halt.

2. That entire volume of space was nipped out of the System, practically speaking. No one entered without permission. No one left under any conditions.

3. By special government patrol ship, Drs. Susan Calvin and Peter Bogert, respectively Head Psychologist and Mathematical Director of United States Robot & Mechanical Men Corporation, were brought to Hyper Base.

Susan Calvin had never left the surface of Earth before, and had had no perceptible desire to leave it this time. In an age of Atomic Power and a clearly coming Hyperatomic Drive, she remained quietly provincial. So she was dissatisfied with her trip and unconvinced of the emergency, and every line of her plain, middle-aged face showed it clearly enough during her first dinner at Hyper Base.

Nor did Dr. Bogert's sleek paleness abandon a certain hangdog attitude. Nor did Major general Kallner, who headed the project, even once forget to maintain a haunted expression.

In short, it was a grisly episode, that meal, and the little session of three that followed began in a gray, unhappy manner.

Kallner, with his baldness glistening, and his dress uniform oddly unsuited to the general mood, began with uneasy directness.

"This is a queer story to tell, sir, and madam. I want to thank you for coming on short notice and without a reason being given. We'll try to correct that now. We've lost a robot. Work has stopped and must stop until such time as we locate it. So far we have failed, and we feel we need expert help."

Perhaps the general felt his predicament anticlimactic. He continued with a note of desperation, "I needn't tell you the importance of our work here. Since the first imperfect Hyper Drive was constructed, the government has spared no effort here. More than eighty percent of last year's appropriations for scientific research have gone to us—"

"Why, we know that," said Bogert, agreeably. "U.S. Robots is receiving a general rental fee for use of our computing robot."

Susan Calvin injected a blunt, vinegary note, "What makes a single robot so important to the project, and why hasn't it been located?"

The general turned his red face towards her and wet his lips quickly. "Why, in a manner of speaking we have located it." Then, with near anguish, "Here, suppose I explain. As soon as the robot failed to report, a state of emergency was declared, and all movement off Hyper Base stopped. A cargo vessel had landed the previous day and had delivered us two robots for our laboratories. It had sixty-two robots of the . . . uh . . . same type for shipment elsewhere. We are certain as to that figure. There is no question about it whatever."

"Yes? And the connection?"

"When our missing robot failed of location anywhere—I assure you we would have found a missing blade of grass if it had been there to find—we brainstormed ourselves into counting the robots left on the cargo ship. They have sixty-three now."

"So that the sixty-third, I take it, is the missing prodigal?" Dr. Calvin's eyes darkened.

"Yes, but we have no way of telling which is the sixty-third."

There was a dead silence while the electric clock chimed eleven times, and then the robopsychologist said, "Very peculiar," and the corners of her lips moved downwards.

"Peter," she turned to her colleague with a trace of savagery, "what's wrong here? What kind of robots are they using at Hyper Base?"



Dr. Bogert hesitated and smiled feebly, "It's been rather a matter of delicacy till now, Susan."

She spoke rapidly, "Yes, till now. If there are sixty-three same-type robots, one of which is wanted and the identity of which cannot be determined, why won't any of them do? What's the idea of all this? Why have we been sent?"

Bogert said in resigned fashion, "If you'll give me a chance, Susan—Hyper Base happens to be using several robots whose brains aren't impressed with the entire First Law of Robotics."

"Aren't impressed?" Calvin slumped back in her chair, "I see. How many were made?"

"A few. It was on government order and there was no way of violating the secrecy. No one was to know except the top men directly concerned. You weren't included, Susan. It was nothing I had anything to do with."

The general interrupted with a measure of authority. "I would like to explain that bit. I hadn't been aware that Dr. Calvin was unacquainted with the situation. I needn't tell you, Dr. Calvin, that there always has been strong opposition to robots on the Planet. The only defense the government has had against the Fundamentalist radicals in this matter was the fact that robots are always built with an unbreakable First Law—which makes it impossible for them to harm human beings under any circumstances."

"But we *had* to have robots of a different nature. So just a few of the NS-2 model, the Nestors, that is, were prepared with a modified First Law. To keep it quiet, all NS-2's are manufactured without serial numbers; modified members are delivered here along with a group of normal robots; and, of course, all our kind are under the strictest impressionment never to tell of their modification to unauthorized personnel." He wore an embarrassed smile, "This has all worked out against us now."

Calvin said grimly, "Have you asked each one who it is, anyhow? Certainly, you are authorized?"

The general nodded, "All sixty-three deny having worked here—and one is lying."

"Does the one you want show traces of wear? The others, I take it, are factory-fresh."

"The one in question only arrived last month. It, and the two that have just arrived, were to be the last we needed. There's no perceptible wear." He shook

his head slowly and his eyes were haunted again, "Dr. Calvin, we don't dare let that ship leave. If the existence of non-First Law robots becomes general knowledge—" There seemed no way of avoiding understatement in the conclusion.

"Destroy all sixty-three," said the robopsychologist coldly and flatly, "and make an end of it."

Bogert drew back a corner of his mouth. "You mean destroy thirty thousand dollars per robot. I'm afraid U.S. Robots wouldn't like that. We'd better make an effort first, Susan, before we destroy anything."

"In that case," she said, sharply, "I need facts. Exactly what advantage does Hyper Base derive from these modified robots? What factor made them desirable, general?"

Kallner ruffled his forehead and smoothed it with an upward gesture of his hand, "We had trouble with our previous robots. Our men work with hard radiations a good deal, you see. It's dangerous, of course, but reasonable precautions are taken. There have been only two accidents since we began and neither was fatal. However, it was impossible to explain that to an ordinary robot. The First Law states—I'll quote it—'*No robot may harm a human being, or through inaction, allow a human being to come to harm.*'"

"That's primary, Dr. Calvin. When it was necessary for one of our men to expose himself for a short period to a moderate gamma field, one that would have no physiological effects, the nearest robot would dash in to drag him out. If the field were exceedingly weak, it would succeed, and work could not continue till all robots were cleared out. If the field were a trifle stronger, the robot would never reach the technician concerned, since its positronic brain would collapse under gamma radiations—and then we would be out one expensive and hard-to-replace robot."

"We tried arguing with them. Their point was that a human being in a gamma field was endangering his life and that it didn't matter that he could remain there half an hour safely. Supposing, they would say, he forgot and remained an hour. They couldn't take chances. We pointed out that they were risking their lives on a wild off-chance. But self-preservation is only the Third Law of Robotics—and the First Law of human safety came first. We gave them orders; we ordered them strictly and

harshly to remain out of gamma fields at whatever cost. But obedience is only the Second Law of Robotics—and the First Law of human safety came first. Dr. Calvin, we either had to do without robots, or do something about the First Law—and we made our choice."

"It wasn't removed, it was modified," explained Kallner. "Positronic brains were constructed that contained the positive aspect only of the Law, which in them reads: '*No robot may harm a human being.*' That is all. They have no compulsion to prevent one coming to harm through an extraneous agency such as gamma rays. I state the matter correctly, Dr. Bogert?"

"Quite," assented the mathematician.

"And that is the only difference of your robots from the ordinary NS-2 model? The only difference? Peter?"

"The only difference, Susan."

She rose and spoke with finality. "I intend sleeping now, and in about eight hours, I want to speak to whoever saw the robot last. And from now on, General Kallner, if I'm to take any responsibility at all for events, I want full and unquestioned control of this investigation."

Susan Calvin, except for two hours of restless lassitude, experienced nothing approaching sleep. She signaled at Bogert's door at the local time of 0700 and found him also awake. He had apparently taken the trouble of transporting a dressing gown to Hyper Base with him, for he was sitting in it. He put his nail scissors down when Calvin entered.

He said, softly, "I've been expecting you more or less. I suppose you feel sick about all this."

"I do."

"Well—I'm sorry. There was no way of preventing it. When the call came out from Hyper Base for us, I knew that something must have gone wrong with the modified Nestors. But what was there to do? I couldn't break the matter to you on the trip here as I would have liked to, because I had to be sure. The matter of the modification is top secret."

The psychologist muttered, "I should have been told. U.S. Robots had no right to modify positronic brains this way without the approval of a psychologist."

Bogert lifted his eyebrows and sighed, "Be reasonable, Susan. You couldn't have influenced them. In this matter, the government was bound to have its way. They want the Hyperatomic Drive and the etheric physicists want robots that won't interfere with them. They were going to get them even if it did mean twisting the

First Law. We had to admit it was possible from a construction standpoint and they swore a mighty oath that they wanted only twelve, that they would be used only at Hyper Base, that they would be destroyed once the Drive were perfected, and that full precautions would be taken. And they insisted on secrecy—and that's the situation."

Dr. Calvin spoke through her teeth, "I would have resigned."

"It wouldn't have helped. The government was offering the company a fortune, and threatening it with antirobot legislation in case of a refusal. We were stuck then, and we're badly stuck now. If this leaks out, it might hurt Kallner and the government, but it would hurt U.S. Robots a devil of a lot more."

The psychologist stared at him, "Peter, don't you realize what all this is about? Can't you understand what the removal of the First Law means? It isn't just a matter of secrecy."

"I know what removal would mean. I'm not a child. It would mean complete instability, with no nonimaginary solutions to the positronic Field Equations."

"Yes, mathematically. But can you translate that into crude psychological thought. All normal life, Peter, consciously or otherwise, resents domination. If the domination is by an inferior, or by a supposed inferior, the resentment becomes stronger. Physically, and, to an extent, mentally, a robot—any robot—is superior to human beings. What makes him slavish, then? *Only the First Law!* Why, without it, the first order you tried to give a robot would result in your death. Unstable? What do you think?"

"Susan," said Bogert, with an air of sympathetic amusement. "I'll admit that this Frankenstein Complex you're exhibiting has a certain justification—hence the First Law in the first place. But the Law, I repeat and repeat, has not been removed—merely modified."

"And what about the stability of the brain?"

The mathematician thrust out his lips, "Decreased, naturally. But it's within the border of safety. The first Nestors were delivered to Hyper Base nine months ago, and nothing whatever has gone wrong till now, and even this involves merely fear of discovery and not danger to humans."

"Very well, then. We'll see what comes of the morning conference."

Bogert saw her politely to the door and grimaced eloquently when she left. He saw no reason to change his perennial

opinion of her as a sour and fidgety frustration.

Susan Calvin's train of thought did not include Bogert in the least. She had dismissed him years ago as a smooth and pretentious sleekness.

Gerald Black had taken his degree in etheric physics the year before and, in common with his entire generation of physicists, found himself engaged in the problem of the Drive. He now made a proper addition to the general atmosphere of these meetings on Hyper Base. In his stained white smock, he was half rebellious and wholly uncertain. His stocky strength seemed striving for release and his fingers, as they twisted each other with nervous yanks, might have forced an iron bar out of true.

Major general Kallner sat beside him, the two from U.S. Robots faced him.

Black said, "I'm told that I was the last to see Nestor 10 before he vanished. I take it you want to ask me about that."

Dr. Calvin regarded him with interest, "You sound as if you weren't sure, young man. Don't you *know* whether you were the last to see him?"

"He worked with me, ma'am, on the field generators, and he was with me the morning of his disappearance. I don't know if anyone saw him after about noon. No one admits having done so."

"Do you think anyone's lying about it?"

"I don't say that. But I don't say that I want the blame of it, either." His dark eyes smoldered.

"There's no question of blame. The robot acted as it did because of what it is. We're just trying to locate it, Mr. Black, and let's put everything else aside. Now if you've worked with the robot, you probably know it better than anyone else. Was there anything unusual about it that you noticed? Had you ever worked with robots before?"

"I've worked with other robots we have here—the simple ones. Nothing different about the Nestors except that they're a good deal cleverer—and more annoying."

"Annoying? In what way?"

"Well—perhaps it's not their fault. The work here is rough and most of us get a little jagged. Fooling around with hyper-space isn't fun." He smiled feebly, finding pleasure in confession. "We run the risk continually of blowing a hole in normal space-time fabric and dropping right out of the universe, asteroids and all. Sounds screwy, doesn't it? Naturally,

you're on edge sometimes. But these Nestors aren't. They're curious, they're calm, they don't worry. It's enough to drive you nuts at times. When you want something done in a tearing hurry, they seem to take their time. Sometimes I'd rather do without."

"You say they take their time? Have they ever refused an order?"

"Oh, no,"—hastily. "They do it all right. They tell you when they think you're wrong, though. They don't know anything about the subject but what we taught them, but that doesn't stop them. Maybe I imagine it, but the other fellows have the same trouble with their Nestors."

General Kallner cleared his throat ominously. "Why have no complaints reached me on the matter, Black?"

The young physicist reddened, "We didn't *really* want to do without he robots, sir, and besides we weren't certain exactly how such . . . uh . . . minor complaints might be received."

Bogert interrupted softly, "Anything in particular happen the morning you last saw it?"

There was a silence. With a quiet motion, Calvin repressed the comment that was about to emerge from Kallner, and waited patiently.

Then Black spoke in blurring anger, "I had a little trouble with it. I'd broken a Kinball tube that morning and was out five days of work; my entire program was behind schedule; I hadn't received any mail from home for a couple of weeks. And he came around wanting me to repeat an experiment I had abandoned a month ago. He was always annoying me on that subject and I was tired of it. I told him to go away—and that's all I saw of him."

"You told him to go away?" asked Dr. Calvin with sharp interest. "In just those words? Did you say 'Go away'? Try to remember the exact words."

There was apparently an internal struggle in progress. Black cradled his forehead in a broad palm for a moment, then tore it away and said defiantly, "I said, 'Go lose yourself.'"

Bogert laughed for a short moment, "And he did, eh?"

But Calvin wasn't finished. She spoke cajolingly, "Now we're getting somewhere, Mr. Black. But exact details are important. In understanding the robot's actions, a word, a gesture, an emphasis may be everything. You couldn't have said just those three words, for instance, could you? By your own description you

must have been in a hasty mood. Perhaps you strengthened your speech a little."

The young man reddened. "Well . . . I may have called it a . . . a few things."

"Exactly what things?"

"Oh—I wouldn't remember exactly. Besides I couldn't repeat it. You know how you get when you're excited." His embarrassed laugh was almost a giggle, "I sort of have a tendency to strong language."

"That's quite all right," she replied, with prim severity. "At the moment, I'm a psychologist. I would like to have you repeat exactly what you said as nearly as you remember, and even more important, the exact tone of voice you used."

Black looked at his commanding officer for support, found none. His eyes grew round and appalled, "But I can't."

"You must."

"Suppose," said Bogert, with ill-hidden amusement, "you address me. You may find it easier."

The young man's scarlet face turned to Bogert. He swallowed. "I said—" His voice faded out. He tried again, "I said—" His voice faded out. He tried again, "I said—"

And he drew a deep breath and spewed it out hastily in one long succession of syllables. Then, in the charged air that lingered, he concluded almost in tears, "... more or less. I don't remember the exact order of what I called him, and maybe I left out something or put in something, but that was about it."

Only the slightest flush betrayed any feeling on the part of the robot-psychologist. She said, "I am aware of the meaning of most of the terms used. The others, I suppose, are equally derogatory."

"I'm afraid so," agreed the tormented Black.

"And in among it, you told him to lose himself."

"I meant it only figuratively."

"I realize that. No disciplinary action is intended, I am sure." And at her glance, the general, who, five seconds earlier, had seemed not sure at all, nodded angrily.

"You may leave, Mr. Black. Thank you for your co-operation."

It took five hours for Susan Calvin to interview the sixty-three robots. It was five hours of multi-repetition; of replacement after replacement of identical robot; of Questions A, B, C, D and Answers A, B, C, D; of a carefully bland expression, a carefully neutral tone, a

carefully friendly atmosphere; and a hidden wire recorder.

The psychologist felt drained of vitality when she was finished.

Bogert was waiting for her and looked expectant as she dropped the recording spool with a clang upon the plastic of the desk.

She shook her head. "All sixty-three seemed the same to me. I couldn't tell—"

He said, "You couldn't expect to tell by ear, Susan. Suppose we analyze the recordings."

Ordinarily, the mathematical interpretation of verbal reaction of robots is one of the more intricate branches of robotic analysis. It requires a staff of trained technicians and the help of complicated computing machines. Bogert knew that. Bogert stated as much, in an extreme of unshown annoyance after having listened to each set of replies, lists of word deviations, and graphs of the intervals of responses.

"There are no anomalies present, Susan. The variations in wording and the time reactions are within the limits of ordinary frequency groupings. We need finer methods. They must have computers here. No." He frowned and nibbled delicately at a thumbnail. "We can't use computers. Too much danger of leakage. Or maybe if we—"

Dr Calvin stopped him with an impatient gesture. "Please, Peter. This isn't one of your petty laboratory problems. If we can't determine the modified Nestor by some gross difference that we can see with the naked eye, one that there is no mistake about, we're out of luck. The danger of being wrong and of letting him escape is otherwise too great. It's not enough to point out a minute irregularity in a graph. I tell you, if that's all I've got to go on, I'd destroy them all just to be certain. Have you spoken to the other modified Nestors?"

"Yes, I have," snapped back Bogert, "and there's nothing wrong with them. They're above normal in friendliness if anything. They answered my questions, displayed pride in their knowledge—except the two new ones that haven't had time to learn their etheric physics. They laughed rather good-naturedly at my ignorance in some of the specializations here." He shrugged, "I suppose that forms some of the basis for resentment towards them on the part of the technicians here. The robots are perhaps too willing to impress you with their greater knowledge."

"Can you try a few Planar Reactions

to see if there have been any change, any deterioration, in their mental set-up since manufacture."

"I haven't yet, but I will." He shook a slim finger at her, "You're losing your nerve, Susan. I don't see what it is you're dramatizing. They're essentially harmless."

"They are?" Calvin took fire. "They are? Do you realize one of them is lying. One of the sixty-three robots I have just interviewed has deliberately lied to me after the strictest injunction to tell the truth. The abnormality indicated is horribly deep-seated, and horribly frightening."

Peter Bogert felt his teeth harden against each other. He said, "Not at all. Look! Nestor 10 was given orders to lose himself. Those orders were expressed in maximum urgency by the person most authorized to command him. You can't counteract that order either by superior urgency or superior right of command. Naturally, the robot will attempt to defend the carrying out of his orders. In fact, objectively, I admire his ingenuity. How better can a robot lose himself than to hide himself among a group of similar robots?"

"Yes, you would admire it. I've detected amusement in you, Peter—amusement and an appalling lack of understanding. Are you a roboticist, Peter? These robots attach importance to what they consider superiority. You've just said as much yourself. Subconsciously they feel humans to be inferior and the First Law which protects us from them is imperfect. They are unstable. And here we have a young man ordering a robot to leave him, to lose himself, which every verbal appearance of revulsion, disdain, and disgust. Granted, that robot must follow orders, but subconsciously, there is resentment. It will become more important than ever for it to prove that it is superior despite the horrible names it was called. It may become so important that what's left of it the First Law won't be enough."

"How on Earth, or anywhere in the Solar System, Susan, is a robot going to know the meaning of the assorted strong language used upon him? Obscenity is not one of the things impressed upon his brain."

"Original impressionment is not everything," Calvin snarled at him. "Robots have learning capacity, you . . . you fool—" And Bogert knew that she had really lost her temper. She continued hastily, "Don't you suppose he

could tell from the tone used that the words weren't complimentary? Don't you suppose he's heard the words used before and noted upon what occasions."

"Well, then," shouted Bogert, "will you kindly tell me one way in which a modified robot can harm a human being, no matter how offended it is, no matter how sick with desire to prove superiority."

"If I tell you one way, will you keep quiet?"

"Yes."

They were leaning across the table at each other, angry eyes nailed together.

The psychologist said, "If a modified robot were to drop a heavy weight upon a human being, he would not be breaking the First Law, if he did so with the knowledge that his strength and reaction speed would be sufficient to snatch the weight away before it struck the man. However, once the weight left his fingers, he would be no longer the active medium. Only the blind force of gravity would be that. The robot could then change his mind and, merely by inaction, allow the weight to strike. The modified First Law allows that."

"That's an awful stretch of imagination."

"That's what my profession requires sometimes. Peter, let's not quarrel. Let's work. You know the exact nature of the stimulus that caused the robot to lose himself. You have the records of his original mental make-up. I want you to tell me how possible it is for our robot to do the sort of thing I just talked about. Not the specific instance, mind you, but that whole class of response. And I want it done quickly."

"And meanwhile—"

"And meanwhile, we'll have to try performance tests directly on the response to First Law."

Gerald Black, at his own request, was supervising the mushrooming wooden partitions that were springing up in a bellying circle on the vaulted third floor of Radiation Building 2. The laborers worked in the main, silently, but more than one was openly a-wonder at the sixty-three photocells that required installation.

One of them sat down near Black, removed his hat, and wiped his forehead thoughtfully with a freckled forearm.

Black nodded at him, "How's it doing, Walensky?"



Walensky shrugged and fired a cigar, "Smooth as butter. What's going on anyway, Doc? First, there's no work for three days and then we have this mess of jiggers." He leaned backwards on his elbows and puffed smoke.

Black twitched his eyebrows, "A couple of robot men came over from Earth. Remember the trouble we had with robots running into the gamma fields, before we pounded it into their skulls that they weren't to do it."

"Yeah. Didn't we get new robots?"

"We got some replacements, but mostly it was a job of indoctrination. Anyway, the people who make them want to figure out robots that aren't hit so bad by gamma rays."

"Sure seems funny, though, to stop all the work on the Drive for this robot deal. I thought nothing was allowed to stop the Drive?"

"Well, it's the fellow upstairs that has the say on that. Me—I just do as I'm told. Probably all a matter of pull —"

"Yeah," the electrician jerked a smile, and winked a wise eye. "Somebody knew somebody in Washington. But as long as my pay comes through on the dot, I should worry. The Drive's none of my affair. What are they going to do here?"

"You're asking me? They brought a mess of robots with them—over sixty, and they're going to measure reactions. That's all my knowledge."

"How long will it take?"

"I wish I knew."

"Well," Walensky said, with heavy sarcasm, "as long as they dish me my money, they can play games all they want."

Black felt quietly satisfied. Let the story spread. It was harmless, and near enough to the truth to take the fangs out of curiosity.

A man sat in the chair, motionless, silent. A weight dropped, crashed downward, then pounded aside at the last moment under the synchronized thump of a sudden force beam. In sixty-three wooden cells, watching NST-2 robots dashed forward in that split second before the weight veered, and sixty-three photocells five feet ahead of their original positions jiggled the marking pen and presented a little jag on paper. The weight rose and dropped, rose and dropped, rose—

Ten times!

Ten times the robots sprang forward

and stopped, as the man remained safely seated.

Major-general Kallner had not worn his uniform in its fulness since the first dinner with the U.S. Robot representatives. He wore nothing over his blue-gray shirt now, the collar was open, and the black tie was pulled loose.

He looked hopefully at Bogert, who was still blandly neat and whose inner tension was perhaps betrayed only by the trace of glister at his temples.

The general said, "How does it look? What is it you're trying to see?"

Bogert replied, "A difference which may turn out to be a little too subtle for our purposes, I'm afraid. For sixty-two of those robots the necessity of jumping toward the apparently threatened human was what we call, in robotics, a forced reaction. You see, even when the robots knew that the human in question would not come to harm—and after the third or fourth time they must have known it—they could not prevent reacting as they did. First Law requires it."

"Well?"

"But the sixty-third robot, the modified Nestor, had no such compulsion. He was under free action. If he had wished, he could have remained in his seat. Unfortunately," and his voice was mildly regretful, "he didn't so wish."

"Why do you suppose?"

Bogert shrugged, "I suppose Dr Calvin will tell us when she gets here. Probably with a horribly pessimistic interpretation, too. She is sometimes a bit annoying."

"She's qualified, isn't she?" demanded the general with a sudden frown of uneasiness.

"Yes," Bogert seemed amused. "She's qualified all right. She understands robots like a sister—comes from hating human beings so much, I think. It's just that, psychologist or not, she's an extreme neurotic. Has paranoid tendencies. Don't take her too seriously."

He spread the long row of broken-line graphs out in front of him. "You see, general, in the case of each robot the time interval from moment of drop to the completion of a five-foot movement tends to decrease as the tests are repeated. There's a definite mathematical relationship that governs such things and failure to conform would indicate marked abnormality in the positronic brain. Unfortunately, all here appear normal."

"But if our Nestor 10 was not re-

sponding with a forced action, why isn't his curve different? I don't understand that."

"It's simple enough. Robotic responses are not perfectly analogous to human responses, more's the pity. In human beings, voluntary action is much slower than reflex action. But that's not the case with robots; with them it is merely a question of freedom of choice, otherwise the speeds of free and forced action are much the same. What I had been expecting, though, was that Nestor 10 would be caught by surprise the first time and allow too great an interval to elapse before responding."

"And he did?"

"I'm afraid not."

"Then we haven't gotten anywhere."

The general sat back with an expression of pain. "It's five days since you've come."

At this point, Susan Calvin entered and slammed the door behind her. "Put your graphs away, Peter," she cried, "you know they don't show anything."

She mumbled something impatiently as Kallner half-rose to greet her, and went on, "We'll have to try something else quickly. I don't like what's happening."

Bogert exchanged a resigned glance with the general. "Is anything wrong?"

"You mean specifically? No. But I don't like to have Nestor 10 continue to elude us. It's bad. It *must* be gratifying his swollen sense of superiority. I'm afraid that his motivation is no longer simply one of following orders. I think it's becoming more a matter of sheer neurotic necessity of outwitting humans. That's a dangerously unhealthy situation. Peter, have you done what I asked? Have you worked out the instability factors of the modified NS-2 along the lines I want?"

"It's in progress," said the mathematician, without interest.

She stared at him angrily for a moment, then turned to Kallner. "Nestor 10 is decidedly aware of what we're doing, general. He had no reason to jump for the bait in this experiment, especially after the first time, when he must have seen that there was no real danger to our subject. The others couldn't help it; but he was deliberately falsifying a reaction."

"What do you think we ought to do now, then, Dr. Calvin?"

"Make it impossible for him to fake an action the next time. We will repeat the experiment, but with an addition.

High-tension cables, capable of electrocuting the Nestor models will be placed between subject and robot—enough of them to avoid the possibility of jumping over—and the robot will be made perfectly aware in advance that touching the cables will mean death."

"Hold on," spat out Bogert with sudden viciousness. "I rule that out. We are not electrocuting two million dollars worth of robots to locate Nestor 10. There are other ways."

"You're certain? You've found none. In any case, it's not a question of electrocution. We can arrange a relay which will break the current at the instant of application of weight. If the robot should place his weight on it, he won't die. *But he won't know that, you see.*"

The general's eyes gleamed in hope. "Will that work?"

"It should. Under those conditions, Nestor 10 would have to remain in his seat. He could be *ordered* to touch the cables and die, for the Second Law of obedience is superior to the Third Law of self-preservation. But he *won't* be ordered to; he will merely be left to his own devices, as will all the robots. In the case of the normal robots, the First Law of human safety will drive them to their death even without orders. But not our Nestor 10. Without the entire First Law, and without having received any orders on the matter, the Third Law, self-preservation, will be the highest operating, and he will have no choice but to remain in his seat. It would be a forced action."

"Will it be done tonight, then?"

"Tonight," said the psychologist. "If the cables can be laid in time. I'll tell the robots now what they're to be up against."

A man sat in the chair, motionless, silent. A weight dropped, crashed downward, then pounded aside at the last moment under the synchronized thump of a sudden force beam.

Only once—

And from her small camp chair in the observing booth in the balcony, Dr. Susan Calvin rose with a short gasp of pure horror.

Sixty-three robots sat quietly in their chairs, staring owlishly at the endangered man before them. Not one moved.

Dr. Calvin was angry, angry almost past endurance. Angry the worse for not daring to show it to the robots that, one by one, were entering the room and then

leaving. She checked the list. Number Twenty-Eight was due in now—Thirty-five still lay ahead of her.

Number Twenty-eight entered, diffidently.

She forced herself into reasonable calm. "And who are you?"

The robot replied in a low, uncertain voice, "I have received no number of my own yet, ma'am. I'm an NS-2 robot, and I was Number Twenty-eight in line outside. I have a slip of paper here that I'm to give you."

"You haven't been in here before this today?"

"No, ma'am."

"Sit down. Right there. I want to ask you some questions, Number Twenty-eight. Were you in the Radiation Room of Building Two about four hours ago?"

The robot had trouble answering. Then it came out hoarsely, like machinery needing oil, "Yes, ma'am."

"There was a man who almost came to harm there, wasn't there?"

"Yes, ma'am."

"You did nothing, did you?"

"No, ma'am."

"The man might have been hurt because of your inaction. Do you know that?"

"Yes, ma'am. I couldn't help it, ma'am." It is hard to picture a large, expressionless metallic figure cringing, but it managed.

"I want you to tell me exactly why you did nothing to save him."

"I want to explain, ma'am. I certainly don't want to have you . . . have *anyone* . . . think that I could do a thing that might cause harm to a master. Oh, no, that would be a horrible . . . an inconceivable—"

"Please don't get excited, boy. I'm not blaming you for anything. I only want to know what you were thinking at the time."

"Ma'am, before it all happened you told us that one of the masters would be in danger of harm from that weight that keeps falling and that we would have to cross electric cables if we were to try to save him. Well, ma'am, that wouldn't stop me. What is my destruction compared to the safety of a master? But . . . but it occurred to me that if I died on my way to him, I wouldn't be able to save him anyway. The weight would crush him and then I would be dead for no purpose and perhaps some day some other master might come to harm who wouldn't have, if I had only

stayed alive. Do you understand me, ma'am?"

"You mean that it was merely a choice of the man dying, or both the man and yourself dying. Is that right?"

"Yes, ma'am. It was impossible to save the master. He might be considered dead. In that case, it is inconceivable that I destroy myself for nothing—without orders."

The robopsychologist twiddled a pencil. She had heard the same story with insignificant verbal variations twenty-seven times before. This was the crucial question now.

"Boy," she said, "your thinking has its points, but it is not the sort of thing I thought you might think. Did you think of this yourself?"

The robot hesitated. "No."

"Who thought of it, then?"

"We were talking last night, and one of us got that idea and it sounded reasonable."

"Which one?"

The robot thought deeply. "I don't know. Just one of us."

She sighed, "That's all."

Number Twenty-nine was next. Thirty-four after that.

Major-general Kallner, too, was angry. For one week all of Hyper Base had stopped dead, barring some paper work on the subsidiary asteroids of the group. For nearly one week, the two top experts in the field had aggravated the situation with useless tests. And now they—or the woman, at any rate—made impossible propositions.

Fortunately for the general situation, Kallner felt it impolitic to display his anger openly.

Susan Calvin was insisting, "Why not, sir? It's obvious that the present situation is unfortunate. The only way we may reach results in the future—or what future is left us in this matter—is to separate the robots. We can't keep them together any longer."

"My dear Dr. Calvin," rumbled the general, his voice sinking into the lower baritone registers. "I don't see how I can quarter sixty-three robots separately on the Base without trouble. We'd have to take them out of the ship. We'd have to place guards over each one, since you haven't even narrowed down the possibilities—meaning no offense. So far we've managed to keep this predicament of ours secret enough. We've explained away our tests plausibly. But guarding sixty-three robots all over the place—"

Dr. Calvin raised her arms helplessly. "I can do nothing then. Nestor 10 will either imitate what the other robots would do, or else argue them plausibly into not doing what he himself cannot do. And in any case, this is bad business. We're in actual combat with this little lost robot of ours and he's winning out. Every victory of his aggravates his abnormality."

She rose to her feet in determination. "General Kallner, if you do not separate the robots as I ask, then I can only demand that all sixty-three be destroyed immediately."

"You demand it, do you?" Bogert looked up suddenly, and with real anger. "What gives you the right to demand any such thing. Those robots remain as they are. I'm responsible to the management, not you."

"And I," added Major-general Kallner, "am responsible to the World Co-ordinator—and I must have this settled."

"In that case," flashed back Calvin, "there is nothing for me to do but resign. If necessary to force you to the necessary destruction, I'll make this whole matter public. It was not I that approved the manufacture of modified robots."

"One word from you, Dr. Calvin," said the General, deliberately, "in violation of security measures, and you would be certainly imprisoned instantly."

Bogert felt the matter to be getting out of hand. His voice grew syrupy, "Well, now, we're beginning to act like children, all of us. We only need a little more time. Surely we can outwit a robot without resigning, or imprisoning people, or destroying two millions."

The psychologist turned on him with quiet fury. "No hypocrisy from you, Peter Bogert. You're after Lanning's place as Director of Research. You have been for five years at least. And destroying thirty robots will spoil your chances. That doesn't ask any deep psychology, you know, just a half-open eye. Well, I'm not ambitious. I just don't want any unbalanced robots in existence. We have one Nestor that's definitely unbalanced, eleven more that are potentially so, and sixty-two normal robots that are being subjected to an unbalanced environment. The only absolutely safe method is complete destruction."

The signal-burr brought all three to a halt, and the angry tumult of growlingly unrestrained emotion froze.

"Come in," growled Kallner.

It was Gerald Black, looking perturbed.

He had heard angry voices. He said, "I thought I'd come myself . . . didn't like to ask anyone else—"

"What is it? Don't orate—"

"The locks on Compartment C in the trading ship have been played with. There are fresh scratches on them."

"Compartment C," exclaimed Calvin quickly. "That's the one that holds the robots, isn't it? Who did it?"

"From the inside," said Black, laconically.

"The lock isn't out of order, is it?"

"No. It's all right. I've been staying on the ship now for four days and none of them have tried to get out. But I thought you ought to know, and I didn't like to spread the news. I noticed the matter myself."

"Is anyone there now?" demanded the general.

"I left Robins and McAdams there."

There was a thoughtful silence, and then Dr. Calvin said ironically, "Well?"

Kallner rubbed his nose uncertainly, "What's it all about?"

"Isn't it obvious? Nestor 10 is planning to leave. That order to lose himself is dominating his abnormal brain past anything we can do. I wouldn't be surprised if what's left of his First Law would scarcely be powerful enough to override it. He is perfectly capable of seizing the ship and leaving with it. Then we'd have a mad robot on a spaceship. What would he do next? Any idea? Do you still want to leave them all together, general?"

"Nonsense," interrupted Bogert. He had regained his smoothness. "All that from a few scratch marks on a lock."

"Have you, Dr. Bogert, completed the analysis I've required, since you volunteered opinions?"

"Yes."

"May I see it?"

"No."

"Why not? Or mayn't I ask that, either?"

"Because there is no point in it, Susan. I told you in advance that these modified robots are less stable than the normal variety, and my analysis shows it. There's a certain very small chance of breakdown under extreme circumstances that are not likely to occur. Let it go at that. I won't give you ammunition for your absurd claim that sixty-two perfectly good robots be destroyed just because so far you lack the ability to detect Nestor 10 among them."

Susan Calvin stared him down and

let disgust fill her eyes. "You won't let anything stand in the way of the directorship, will you?"

"Please," begged Kallner, half in irritation. "Do you insist that nothing further can be done, Dr Calvin?"

"I can't think of anything, sir," she replied, wearily. "If there were only other differences between Nester 10 and the normal robots, differences that didn't involve the First Law. Even one other difference. Something in impressionment, environment, specification—." And she stopped suddenly.

"What is it?"

"I've thought of something . . . I think—" Her eyes grew distant and hard. "These modified Nestors, Peter? They get the same impressioning the normal ones get, don't they?"

"Yes. Exactly the same."

"And what was it you were saying, Mr. Black?" she turned to the young man, who through the storms that had followed his news had maintained a discreet silence. "Once when complaining of the Nestors' attitude of superiority, you said the technicians had taught them all they knew."

"Yes, in etheric physics. They're not acquainted with the subject when they come here."

"That's right," said Bogert, in surprise.

"I told you, Susan, when I spoke to the other Nestors here that the two new arrivals hadn't learned etheric physics yet."

"And why is that?" Dr. Calvin was speaking in mounting excitement. "Why aren't NS-2 models impressioned with etheric physics to start with?"

"I can tell you that," said Kallner. "It's all of a piece with the secrecy. We thought that if we made a special model with knowledge of etheric physics, used twelve of them, and put the others to work in an unrelated field, there might be suspicion. Men working with normal Nestors might wonder why they knew etheric physics. So there was merely an impressionment with a capacity for training in the field. Only the ones that come here, normally, receive such a training. It's that simple."

"I understand. Please get out of here, the lot of you. Let me have an hour or so."

Calvin felt she could not face the ordeal for a third time. Her mind had contemplated it and rejected it with an intensity that left her nauseated. She

could face that unending file of repetitious robots no more.

So Bogert asked the questions now, while she sat aside, eyes and mind half-closed.

Number Fourteen came in—forty-nine to go.

Bogert looked up from the guide sheet and said, "What is your number in line?"

"Fourteen, sir." The robot presented his numbered ticket.

"Sit down, boy."

Bogert asked, "You haven't been here before on this day?"

"No, sir."

"Well, boy, we are going to have another man in danger of harm soon after we're through here. In fact, when you leave this room, you will be led to a stall where you will wait quietly, till you are needed. Do you understand?"

"Yes, sir."

"Now, naturally, if a man is in danger of harm, you will try to save him."

"Naturally, sir."

"Unfortunately, between the man and yourself, there will be a gamma ray field."

Silence.

"Do you know what gamma rays are?" asked Bogert sharply.

"Energy radiation, sir?"

The next question came in a friendly, offhand manner, "Ever work with gamma rays?"

"No, sir." The answer was definite.

"Hm-m. Well, boy, gamma rays will kill you instantly. They'll destroy your brain. That is a fact you must know and remember. Naturally, you don't want to destroy yourself."

"Naturally." Again the robot seemed shocked. Then, slowly, "But, sir, if the gamma rays are between myself and the master that may be harmed, how can I save him? I would be destroying myself to no purpose."

"Yes, there is that." Bogert seemed concerned about the matter. "The only thing I can advise, boy, is that if you detect the gamma radiation between yourself and the man, you may as well sit where you are."

The robot was openly relieved. "Thank you, sir. There wouldn't be any use, would there?"

"Of course not. But if there weren't any dangerous radiation, that would be a different matter."

"Naturally, sir. No question of that."

"You may leave now. The man on



the other side of the door will lead you to your stall. Please wait there."

He turned to Susan Calvin when the robot left. "How did that go, Susan?"

"Very well," she said, dully.

"Do you think we could catch Nestor 10 by quick questioning on etheric physics?"

"Perhaps, but it's not sure enough." Her hand lay loosely in her lap. "Remember, he's fighting us. He's on his guard. The only way we can catch him is to outsmart him—and, within his limitations, he can think much more quickly than a human being."

"Well, just for fun—suppose I ask the robots from now on a few questions on gamma rays. Wave length limits, for instance."

"No!" Dr Calvin's eyes sparked to life. "It would be too easy for him to deny knowledge and then he'd be warned against the test that's coming up—which is our real chance. Please follow the questions I've indicated, Peter, and don't improvise. It's just within the bounds of risk to ask them if they've ever worked with gamma rays. And try to sound even less interested than you do when you ask it."

Bogert shrugged, and pressed the buzzer that would allow the entrance of Number Fifteen.

The large Radiation Room was in readiness once more. The robots waited patiently in their wooden cells, all open to the center but closed off from each other.

Major-general Kallner mopped his brow slowly with a large handkerchief while Dr Calvin checked the last details with Black.

"You're sure now," she demanded, "that none of the robots have had a chance to talk with each other after leaving the Orientation Room?"

"Absolutely sure," insisted Black. "There's not been a word exchanged."

"And the robots are put in the proper stalls?"

"Here's the plan."

The psychologist looked at it thoughtfully, "Um-m-m."

The general peered over her shoulder. "What's the idea of the arrangements, Dr. Calvin?"

"I've asked to have those robots that appeared even slightly out of true in the previous tests concentrated on one side of the circle. I'm going to be sitting in the center myself this time, and I wanted to watch those particularly."

"You're going to be sitting there—" exclaimed Bogert.

"Why not?" she demanded coldly. "What I expect to see may be something quite momentary. I can't risk having anyone else as main observer. Peter, you'll be in the observing booth, and I want you to keep your eye on the opposite side of the circle. General Kallner, I've arranged for motion pictures to be taken of each robot, in case visual observation isn't enough. If these are required, the robots are to remain exactly where they are until the pictures are developed and studied. None must leave, none must change place. Is that clear?"

"Perfectly."

"Then let's try it this one last time."

Susan Calvin sat in the chair, silent, eyes restless. A weight dropped, crashed downward, then pounded aside at the last moment under the synchronized thump of a sudden force beam.

And a single robot jerked upright and took two steps.

And stopped.

But Dr. Calvin was upright, and her finger pointed to him sharply. "Nestor 10, come here," she cried, "come here! COME HERE!"

Slowly, reluctantly, the robot took another step forward.

The psychologist shouted at the top of her voice, without taking her eyes from the robot, "Get every other robot out of this place, somebody. Get them out quickly, and keep them out."

Somewhere within reach of her ears there was noise, and the thud of hard feet upon the floor. She did not look away.

Nestor 10—if it was Nestor 10—took another step, and then, under force of her imperious gesture, two more. He was only ten feet away, when he spoke harshly. "I have been told to be lost—"

Another step. "I must not disobey. They have not found me so far— He would think me a failure— He told me— But it's not so— I am powerful and intelligent—"

The words came in spurts.

Another step. "I know a good deal— He would think . . . I mean I've been found— Disgraceful— Not I— I am intelligent— And by just a master . . . who is weak— Slow—"

Another step—and one metal arm flew out suddenly to her shoulder, and she felt the weight bearing her down. Her

throat constricted, and she felt a shriek tear through.

Dimly, she heard Nestor 10's next words, "No one must find me. No master—" and the cold metal was against her, and she was sinking under the weight of it.

And then a queer, metallic sound, and she was on the ground with an unfelt thump, and a gleaming arm was heavy across her body. It did not move. Nor did Nestor 10, who sprawled beside her.

And now faces were bending over her.

Gerald Black was gasping, "Are you hurt, Dr. Calvin?"

She shook her head feebly. They pried the arm off her and lifted her gently to her feet, "What happened?"

Black said, "I bathed the place in gamma rays for five seconds. We didn't know what was happening. It wasn't till the last second that we realized he was attacking you, and then there was no time for anything but a gamma field. He went down in an instant. There wasn't enough to harm you though. Don't worry about it."

"I'm not worried." She closed her eyes and leaned for a moment upon his shoulder. "I don't think I was attacked exactly. Nestor 10 was simply *trying* to do so. What was left of the First Law was still holding him back."

"You're sure it was Nestor 10?" asked the general, eagerly.

"Oh, yes. No possible doubt."

Susan Calvin and Peter Bogert, two weeks after their first meeting with Major-general Kallner had their last. Work at Hyper Base had been resumed. The trading ship with its sixty-two normal NS-2's was gone to wherever it was bound, with an officially-imposed story to explain its two weeks' delay. The government cruiser was making ready to carry the two roboticists back to Earth.

Kallner was once again a-gleam in dress uniform. His white gloves shone as he shook hands.

Calvin said, "The other modified Nestors are, of course, to be destroyed."

"They will be. We'll make shift with

normal robots, or, if necessary, do without."

"Good."

"But tell me— You haven't explained— How was it done?"

She smiled tightly, "Oh, that. I would have told you in advance if I had been more certain of its working. You see, Nestor 10 had a superiority complex that was becoming more radical all the time. He liked to think that he and others robots knew more than human beings. It was becoming very important for him to think so.

"We knew that. So we warned every robot in advance that gamma rays would kill him, which it would, and we further warned them all that gamma rays would be between them and myself. So they all stayed where they were, naturally. By Nestor 10's own logic in the previous test they had all decided that there was no point in trying to save a human being if they were sure to die before they could do it."

"Well, yes, Dr. Calvin, I understand that. But why did Nestor 10 himself leave his seat?"

"Ah! That was a little arrangement between myself and your young Mr. Black. You see it wasn't gamma rays that flooded the area between myself and the robots—but infrared rays. Just ordinary heat rays, absolutely harmless. Nestor 10 knew they were infrared and harmless and so he began to dash out, as he expected the rest would do, under First Law compulsion. It was only a fraction of a second too late that he remembered that the normal NS-2's could detect radiation, but could not identify the type. That he himself could only identify wave lengths by virtue of the training he had received at Hyper Base. To the normal robots the area was fatal because we had told them it would be, and only Nestor 10 knew we were lying.

"And for just a moment he forgot, or didn't want to remember, that other robots might be more ignorant than human beings, and his superiority caught him. Good-by, general."



# THE CHRONOKINESIS OF

*Time travel might make murder easy—but time travel itself, even though accomplished, might not be an easy thing to bear—*

THIS isn't, properly speaking, Fergus O'Brien's story, though it starts with him. Fergus is a private detective, but he didn't function as a detective in the Jonathan Hull episode. It was no fault of his Irish ingenuity that he provided the answer to the mystery; he simply found it, all neatly typed out for him. Typed, in fact, before there ever was any mystery.

In a way, though, it's a typical O'Brien anecdote. "I'm a private eye," Fergus used to say, "and what happens to me shouldn't happen to a Seeing Eye. I'm a catalyst for the unbelievable." As in the case of Mr. Harrison Partridge, who found that the only practical use for a short-range time machine was to provide the perfect alibi for murder. But the Partridge case was simplicity itself compared to the Hull business.

It began—at least according to one means of reckoning a time sequence—on the morning after Fergus had trapped the murderer in the Dubrovsky case—a relatively simple affair involving only such prosaic matters as an unbreakable alibi and a hermetically sealed room.

None the less it was a triumph that deserved, and received, wholehearted celebration, and it was three o'clock before Fergus wound up in bed. It was eight when he unwound upon hearing a thud in the corner of the room. He sat up and stared into the gloom and saw a tall thin figure rising from the floor. The figure moved over to his typewriter and switched on the light. He saw a man of about sixty, clean-shaven, but with long, untrimmed gray hair. An odd face—not unkindly, but slightly inhuman, as though he had gone through some experience so unspeakable as to set him a little apart from the rest of his race.

Fergus watched curiously as the old man took an envelope out of a drawer in the desk, opened it, unfolded the papers it contained, set them in a pile beside the typewriter, took the topmost sheet, inserted it in the machine, and began typing furiously.

It seemed a curious procedure, but Fergus' mind was none too clear and the outlines of the room and of the typist still tended to waver. *Oh well*, Fergus thought, *long-haired old men at type-*

*writers is pretty mild in view of those boilermakers.* And he rolled over and back to sleep.

It was about an hour later that he opened his eyes again, much surprised to find Curly Locks still there. He was typing with his right hand, while his left rested on a pile of paper beside him. As Fergus watched, the old man pulled a sheet from the typewriter and added it to the pile at his left. Then he put the pile in the side section of the desk which housed unused paper, rose from the machine, switched off the light, and walked out the door; with a curious awkward walk, as though he had been paralyzed for years and had had to learn the technique all over again.

The dominant O'Brien trait, the one that has solved more cases than any amount of ingenuity and persistence, is curiosity. A phantasm that stays right there while you sleep is worth investigating. So Fergus was instantly out of bed, without even bothering to pull on a robe, and examining the unused paper compartment.

He sighed with disgust. All the sheets were virginally white. It must have been a delusion after all, though of a singular sort. He turned back to bed. But as he did so, his eye glanced at the corner where he had heard that first thud. He executed a fabulous double take and looked again. There was no doubt about it.

In that corner lay the body of a tall thin man of about sixty, clean-shaven, but with long untrimmed gray hair.

The average man might find some difficulty in explaining to the police how an unidentified corpse happened to turn up in his bedroom. But Detective lieutenant A. Jackson had reached the point where he was surprised at nothing that involved O'Brien.

He heard the story through and then said judiciously, "I think we'll leave your typewriter out of the report, Fergus. If your Irish blood wants to go fev on you, it's O.K. with me; but I think the Psychological Research Society would be more interested in a report on it than the L.A. Police Department. He died when you heard that thud, so his actions thereafter are pretty irrelevant."

# JONATHAN HULL

By ANTHONY  
BOUCHER



"Cyanide?" Fergus asked.

"Smell it from here, can't you? And the vial still clenched in his hand, so there's no doubt of a verdict of suicide. To try a little reconstruction: Say he came to see you professionally about whatever was preying on him. Found you asleep and decided to wait, but finally got restless and finished the job without seeing you."

"I guess so," said Fergus, taking another gulp of tomato juice. "This and the coffee make the typewriter episode seem pretty unlikely. But no O'Brien's gone in for second sight since great-great-grandfather Seamus. I'll expect the family leprechaun next."

"Tell him these shoes need resoling," said Lieutenant Jackson.

For twenty-four hours the affair rested at that. Suicide of Unknown. Nothing to identify him, not even laundry marks. Checkup on fingerprints fruitless. One odd thing that bothered Jackson a little: the man's trousers had no cuffs.

Sergeant Marcus, whose uncle was in cloaks and suits, had an idea on that. "If we get into this war and run into a shortage of material, we'll all be wearing 'em like that. Maybe he's setting next year's styles."

When Fergus heard this, he laughed. And then he stopped laughing and sat down and began thinking. He thought through half a pack of Camels in a chain before he gave up. There was a hint there. Something that was teasing him. Something that reminded him of the Partridge case and yet not quite.

The notion was still nibbling at the back of his mind when Jackson called him the next day. "Something might interest you, Fergus. Either a pretty far-fetched coincidence or part of a pattern."

"My pattern?"

"Your pattern maybe. Another old man with long hair and no identification. Found in a rooming house out on Adams in a room that was supposed to be vacant. But this one was shot."

Fergus frowned. "Could be. But is long hair enough to make it a coincidence?"

"Not by itself. But he hasn't any cuffs on his pants either."

Fergus lost no time in getting to the West Adams address. One time mansion fallen on evil days, reduced to transient cubicles. The landlady was still incoherently horrified.

"I went into the room to fix it up like I always do between tenants and there on the bed—"

Jackson shoed her out. The photographing and fingerprinting squads had come and gone, but the basket hadn't arrived yet. He and Fergus stood alone and looked at the man. He was even older than the other—somewhere in his late seventies, at a guess. A hard, cruel face, with a dark hole centered in its forehead.

"Shot at close range," Jackson was commenting. "Powder burns. Gun left here—clear prints on it." There was a knock on the door. "That'll be the basket."

Fergus looked at the trousers. The cuffs hadn't been taken off. They were clearly tailored without cuffs. Two old men with cuffless trousers—

Jackson had gone to open the door. Now he started back with a gasp. Fergus turned. Gasps aren't easily extorted from a police lieutenant, but this one was justified. Coming in the door was the exact twin of Fergus' typing corpse, and walking with that same carefully learned awkwardness.

He seemed not to notice the corpse on the bed, but he turned to Jackson when the officer demanded, "And who are you?" To be exact, he seemed to turn a moment before Jackson spoke.

He said something. Or at least he made vocal noises. It was a gibberish not remotely approximating any language that either detective had ever heard. And there followed a minute of complete cross-purposes, a cross-examination in which neither party understood a syllable of the other's speech.

Then Fergus had an idea. He took out his notebook and pencil and handed them over. The old man wrote rapidly and most peculiarly. He began in the lower right hand corner of the page and wrote straight on to the upper left. But the message, when he handed it back, was in normal order.

Fergus whistled. "With that act on a blackboard, you could pack 'em in." Then he read the message:

I see that I will have succeeded, and because of the idea that has just come to my mind I imagine that you already understand this hell as much as it is possible for one to understand who has not gone through it and know that it is impossible to arrest me. But if it will simplify your files, you may consider this a confession.

Jonathan Hull

Jackson drew his automatic and moved toward the door. Fergus took out one of



his cards with business and home address and penciled on it:

Look me up if you need help straightening this out.

An idea seemed to strike the man as he accepted the card. Then his features widened in a sort of astonished gratification and he looked at the bed. Then with that same rapid awkwardness he was walking out of the room.

Detetive lieutenant Jackson called a warning to him. He tried to grab him. But the man went right on past him. It isn't easy to fire a close-range bullet into a gray-haired old man. He was out of the room and on the stairs before Jackson's finger could move, and then the bullet went wild.

Jackson was starting out of the room when he felt Fergus' restraining hand on his arm. He tried to shake it off, but it was firm. "You'll never catch him, Andy," said Fergus gently. "Never in God's green eternity. Because you see you can't have caught him or he couldn't have typed—"

Jackson exploded. "Fergus! You don't think this trick-writing expert is another wraith for your second sight, do you? I saw him, too. He's real. And he must be your corpse's twin. If we find him, we can have the answer to both deaths. We can—"

"Telephone for you, lieutenant," the landlady called.

When Jackson returned, his chagrin over Jonathan Hull's escape was forgotten. "All right," he said wearily. Have it your way, Fergus. Ghosts we have yet. Do I care?"

"What happened?"

"Anything can happen. Everything probably will. There's no more sense and order in the world. Nothing a man can trust."

"But what is it?"

"Fingerprints. They don't mean a thing any more."

"The prints on the gun?" Fergus said eagerly. "They belong to my corpse?"

Jackson nodded shamefacedly. "So a cuffless ghost came back and— But it's worse than that. Much worse. This stiff's prints—they belong to a seventeen-year-old kid working out at Lockheed." With these words the lanky lieutenant seemed to reach the depth of despair.

But they brought new hope to Fergus' face and a triumphant glint to his green

eyes. "Perfect, Andy! I couldn't have asked for better. That rounds it off."

Jackson looked up wide-eyed. "You mean it makes sense? O.K., maestro; what's the answer?"

"I don't know," said Fergus coolly. "But I know *where* the answer is; in the drawer of my desk."

He stubbornly refused to say a word until they were in his room. Then he said, "Look at all the little things we saw: How Hull turned to you just *before* you spoke to him; how he registered amazement, and *then* looked at the corpse; above all, how he wrote that note. And the wording of the note too: 'I *will* have succeeded,' and how we must *already* understand because of something he just thought of. There's only one answer to it all:

*"Jonathan Hull is living backwards."*

Jackson burst out with a loud, "Nonsense!"

"It even explains the absence of the cuffs. They're trousers from next year, when we'll be in the war and Sergeant Marcus' prophecy will come true."

"Then you mean that the other stiff too—?"

"Both of 'em."

"O.K. Grant you that much, and I suppose in some cockeyed way it explains the prints of a corpse on a murder weapon. But that kid out at Lockheed—"

"—is your second stiff. But don't trust me: Let's see what Hull himself has to say." Fergus reached for the drawer.

"Hull left a message before he bumped himself off?"

"Don't you see? If he's living backwards, he came into my room, sat at the typewriter, wrote a message, and then killed himself. I just saw it being reeled off hindsideteto. So when I 'saw' him taking an envelope out of this drawer, he was actually, in his own time-sequence, *putting it in*."

"I'll believe you," said Jackson, "when I see—"

Fergus had pulled the drawer open. There lay a fat envelope, inscribed:

FOR FERGUS O'BREEN  
FROM JONATHAN HULL.

"All right," said the lieutenant, "so your conclusion is correct. That still doesn't mean your reasoning is. How can a man live backwards? You might as well ask the universe to run in reverse entropy."

"Maybe it does," said Fergus. "Maybe Hull just found out how to go forwards."

Jackson snorted. "Well, let's see what he says."

Fergus read: "'The first indication of my strange destiny was that I could see ghosts, or so I then interpreted the phenomena.'"

Jackson groaned. "Ghosts we have again! Fergus, I will not have the supernatural. The parascientific is bad enough, but the supernatural—no!"

"Is there necessarily any difference?" Fergus asked. "What we haven't found the answer to, we call supernatural. Maybe Jonathan Hull found an answer or two. Subside, Andy, and let's settle down to this."

They settled.

### THE NARRATIVE OF JONATHAN HULL.

The first indication of my strange destiny was that I could see ghosts, or so I then interpreted the phenomena. The first such episode occurred when I was five years and came in from the yard to tell the family that I had been playing with Gramps. Since my grandfather had died the previous year in that mysterious post-war epidemic, the family was not a little concerned as to my veracity; but no amount of spanking shook me from my conviction.

Again in my twentieth year, I was visited in my lodgings near the Institute by my father, who had died when I was fifteen. The two visitations were curiously similar. Both apparitions spoke unintelligible gibberish and walked with awkwardly careful movements.

If not already, you will soon recognize these two traits, Mr. O'Brien. When I add that the Hulls are noted for the marked physical resemblance between generations, you will readily understand the nature of these apparent ghosts.

On neither of these occasions did I feel any of the conventional terror of revenants. In the first case, because I was too young to realize the implications of the visit; in the second, because I had by my twentieth year already reached the conclusion that my chief interest in life lay in the fringes of normal existence.

Too much of scientific work, by the time I reached the Institute, was being devoted to further minute exploration of the already known, and too little to any serious consideration to the unknown or half-known, the shadowy blurs on the edges of our field of vision. To pursue the work as mathematical physicist for which I was training myself meant, I feared, a blind alley of infinite refinement and elaboration.

To be sure, there was the sudden blossom-

ing of atomic power which had begun after the war, when peacetime allowed the scientists of the world to pool their recent discoveries with no fear lest they be revealing a possible secret weapon. But the work that needed doing now in that field was that of the mechanic, the technician. Theory was becoming fixed and settled, and it was upon my skill in theoretical matters that I prided myself.

Yes, I was the bright young lad then. There were no limits to my aspirations. The world should glow with the name of Hull. And behold me now: a ghost even to myself, a murderer, and soon a suicide. Already, if my understanding of the reversal is correct, my body lies in that corner; but I cannot turn my eyes to it to verify my assumption. And I was always more satisfied with the theory than with the fact.

I was the prodigy of the Institute. I was the shining star. And Lucifer was a shining star, too.

When the United Nations established the World Institute for Paranormal Research at Basle, I recognized my niche. My record at the local institute and my phenomenal score in the aptitude test made my admission a matter of course. And once surrounded by the magnificent facilities of the WIPR, I began to bestow upon the name of Hull certain small immortalities.

Yes, there is that consolation. The name of Hull will never quite die while extra-sensory perception is still measured in terms of the H. Q., the Hull quotient, or while Hull's "Co-ordinating Concordance to the Data of Charles Fort" still serves as a standard reference work. Nor, I suppose, while mystery-mongers probe the disappearance of Jonathan Hull and couple his name with those of Sir Benjamin Bathurst and the captain of the *Marie Celeste*—a fate that shall be averted, Mr. O'Brien, if you follow carefully the instructions which I shall give you later.

But more and more one aspect of the paranormal began to absorb me. I concentrated on it, devouring everything I could obtain in fact or fiction, until I was recognized as the WIPR's outstanding authority upon the possibilities of chronokinesis, or time travel.

It was a happy day when I hit upon that word *chronokinesis*. Its learned sound seemed to remove the concept from the vulgar realm of the time machines cheapened by fiction fantasists. But even with this semantic advantage, I still had many prejudices to battle, both among the populace and among my own colleagues. For even the very men who had established extra-sensory perception upon a scientific basis could still sneer at time travel.

I knew, of course, of earlier attempts.

And now, I realize, Mr. O'Brien, why I was inclined to trust you the moment I saw your card. It was through a fortunately preserved letter of your sister's, which wound its way into our archives, that we knew of the early fiasco of Harrison Partridge and your part therein. We knew, too, of the researches of Dr. Derringer, and how he gave up in despair after his time traveler failed to return, having encountered who knows what unimaginable future barrier.

We learned of no totally successful chronokinetic experiment. But from what we did know of the failures, I was able to piece together a little of what I felt must involve the rotation of a temporary magnetic field against the "natural" time stream, and Hackendorf's current researches would make the establishment of such a field a simple matter.

It was then that I hit upon my concept of reversed individual entropy—setting, so to speak, the machinery of the individual running in an order opposite to the normal, so that movement along the "contrary" direction of the time stream would be for him natural and feasible.

This was what brought about the break. There were some among my colleagues who thought the notion ridiculous. There were others, those hyperserious scientists who take upon themselves the airs of hierophants, who found it even sacrilegious and evil. There were a few practical souls who simply feared it to be impossibly dangerous.

There was not one who would tolerate my experiments. And that is why, Lucifer-like, I severed my connection with the WIPR and retired to America, to pursue by myself the chronokinetic researches which would, I was sure, make Hull a name to rank with the greatest in all the history of science.

It was at this time that Tim Givens enters into the story. My own character I think you will have gathered sufficiently from these pages, but of Givens I must give a more explicit picture.

He was almost twenty years older than I, and I was then thirty. This was in 1971, which meant that he was just a boy fresh out of high school at the time of the war. His first experience of life was to find himself in an aircraft factory earning highly impressive sums. He had no sooner adjusted himself to a wonderful and extravagant life than he was drafted and shortly engaged in slaughtering Japanese in the Second Malayan Campaign.

He came back from the war pitifully maladjusted. It was difficult enough for most young men to return to civilian life; it was impossible for Tim Givens, because the only civilian life he had known, the lavish boom of war industry, was no more.

We skillfully avoided a post-war depression, true, but we did not return to the days when untrained boys in their teens could earn more in a week than their fathers had hoped to see in a month.

Given felt that he had saved the world, and that the world in return owed him the best. He took part payment on that debt when and where he could. He was not a criminal; he was simply a man who took short cuts whenever possible.

I cannot say that I liked him. But he was recommended to me through remote family connections; he had a shiftily alert mind; and he had picked up, in the course of his many brief jobs, a surprising mechanical dexterity and ingenuity. The deciding factor, of course, was that the skilled technicians I should have wished to employ were reluctant to work with a man who had left the WIPR under something of a cloud.

So I took Givens on as my handyman and assistant. Personal relationships had never formed a major element in my life. I thought that I could tolerate his narrow selfishness, his occasional banal humor, his basic crassness. I did not realize how lasting some personal relationships may be.

And I went on working on the theory of reversed entropy. My calculations will be found in my laboratory. It would be useless to give them here. They would be meaningless in 1941; so much depends upon the variable significance of the Tamirovich factor—discovered 1958—and the peculiar proportions of the alloy duralin—developed in the 1960's—and my own improvement on it which I had intended to christen chroinalin.

The large stationary machine—stationary both in space and in time—was to furnish the field which would make it possible for us to free ourselves from the "normal" flow of time. The small handsets were to enable us to accelerate and decelerate and eventually, I trusted, to reverse our temporal motion.

This, I say, was the plan. As to what ultimately happened—

I am sure that Tim Given substituted a cheaper grade of duralin for the grade which had met my tests. He could have netted a sizable profit on the substitution, and it would have been typical of his petty opportunism. He never admitted as much, but I remain convinced.

And so what happened was this:

We entered the large machine. For a moment I had been worried. I thought I had seen two suspicious-looking figures backing into the room by the rear door, and I feared vandalism. But a checkup indicated nothing wrong and no sign of intruders; and I pressed the control.

I cannot describe that sensation to anyone who has not experienced it. A sudden wrenching that seems to take all your

vitals, carefully turn them inside out in some fourth dimension, and replace them neatly in your shaken body. A horrible sensation? I suppose so; but at the moment it was beautiful to me. It meant that something had happened.

Even Tim Givens looked beautiful to me, too. He was my partner on the greatest enterprise of the century—of the centuries. I had insisted on his presence because I wanted a witness for my assertions later; and he had assented because, I think, he foresaw a mint of money to be earned in television lectures by The Man Who Traveled in Time.

I adjusted the handset to a high acceleration so that we might rapidly reach a point sufficiently past to be striking. (Givens' handset was telesynchronized with mine; I did not trust his own erratic impulses.) At the end of ten minutes I was frowning perplexedly. We were still in the stationary machine and we should by now have passed the point at which I constructed it.

Givens did not notice my concern, but casually asked, "O.K. yet, M. S.?" He thought it humorous to call me "M. S.," which was, indeed, one of my degrees but which he insisted stood for Mad Scientist.

Whatever was wrong I would not find it out by staying there. Perhaps nothing whatsoever had happened. And yet that curious wrenching sensation surely indicated that the temporomagnetic field had had some effect.

I beckoned to Givens to follow me, and we stepped out of the machine. Two men were backing away from it in the distance. Their presence and their crablike retrograde motion worried me, and reminded me of those other two whom we had only glimpsed. To avoid them, we hastily slipped out the rear door, and into a world gone mad.

For a moment I had the absurd notion that some inconceivable error had catapulted us into the far distant future. Surely nothing else could account for a world in which men walked rapidly backwards along sidewalks and conversed in an unheard of gibberish.

But the buildings were those of 1971. The sleek atomic motorcars, despite their fantastic reverse motion, were the familiar 1972 models. I realized the enormity of our plight just as Tim Givens ejaculated: "M. S., everything's going backwards."

"Not everything," I said succinctly, and added none too grammatically, "Just us."

I knew now who the two crab-backing men were that we had seen in the laboratory: ourselves. And I recognized, too, what conspicuous figures we must now be, walking backwards along the sidewalk. Already we were receiving curious stares, which seemed to us, of course, to come just before the stargers noticed us.

"Stand still," I said. "We're attracting attention. We don't want to advertise our situation, whatever it is."

We stood there for an hour, while I alternately experimented with the handsets and wrestled with the problem of our existence. The former pursuit I soon found completely fruitless. Obviously the handsets exerted no effect whatsoever upon our status. The latter was more rewarding, for in that hour I had fixed several of the rules necessary to our reversed existence.

It had been early morning when we entered the stationary machine, and by now the sun was already setting in the east—a phenomenon to which I found perhaps more difficulty in adjusting myself than anything else that befell us. "As I recall," I said, "last night, which we are now reapproaching, was exceedingly cold. We need shelter. The laboratory was unoccupied last night. Come."

Followed, or rather preceded, by the stares of passersby we returned to the laboratory, and there for a moment found peace. The disturbingly arsy-versy normal world was shut off from us, and nothing reminded us of our perverse condition save the clock which persistently told off the minutes counterclockwise.

"We shall have to face the fact," I said, "that we are living backwards."

"I don't get it," Givens objected. "I thought we were going to go time-traveling."

"We are," I smiled ruefully, and yet not without a certain pride. "We are traveling backwards in time, something that no one in the history of our race has hitherto accomplished. But we are doing so at the rate, if I may put it somewhat paradoxically, of exactly one second per second; so that the apparent result is not noticeable travel, but simply reverse living."

"O.K.," he grunted. "Spread on the words any way you want. But this is what's bothering me the most: When are we doing to eat?"

I confess that I myself was feeling a certain nervous hunger by now. "There's always food in this small icebox here," I said. I was exceedingly fond of scrambled eggs at midnight when working on a problem. "What would you say to beer and eggs?"

I took out a plastic beer-tainer, pressed down the self-opener, and handed it to Givens as it began to foam. I took another for myself. It felt good and reassuringly normal as it went down.

Then I set down the beer-tainer, found a frying pan, and put it on the small electric range. I fetched four eggs from the icebox and returned to the stove to find no frying pan. I reached out another—it looked like the same one—but handling frying pans while holding four eggs is difficult. Both eggs and pan escaped my grip and went rolling off to a corner of the lab. I hastened



after them, cloth in hand, to clean up the mess.

There was no mess. There was no frying pan either, and no eggs.

Dazed, I returned to my beer: And there was no beer.

I got another beer-tainer out of the ice-box, and sipping from it I drew a most important conclusion. Physical objects which we wore or held were affected by our fields and remained with us. Anything which we set down went on its normal course—away from us forever.

This meant that cooking was impossible for us. So would be eating in a restaurant, for we and the waiter would be going in temporally opposite directions. I explained this to Givens while we ate cheese.

"It's just a sample," I said, "of the problems we have ahead of us. If it weren't for the bare chance of achieving a reversal sometime, I should be tempted to shuffle off this coil now."

It took him a moment to gather my meaning. Then he guffawed and said, "Uh uh, M. S. Not for little Timmy. Life's the one thing to hold on to—the one thing worth living. And even if it's a screwy wrongwayround life, I'm holding on."

Authors of your time, Mr. O'Brien, have occasionally written of time in reverse; but have they ever realized the petty details that such a life involves? All contact with other humanity is impossible. I have, through thirty years of practice, developed a certain ability to understand reverse speech, but no one can understand me in return. And even by written messages, how can an exchange be carried on if you ask me a question at 12:00 o'clock and I answer it at 11:59?

Then there is the problem of food. Not only this question of cooking; but how is one to buy food? How, as one's own clothes wear out, is one to replace them? Imagine yourself speeding along on an empty train, while another train laden with all the necessities of life passes on the parallel track in the opposite direction.

The torture of Tantalus was nothing to this.

I owe my life, such as it is, to Tim Givens, for it was his snide ingenuity which solved this problem. "It's a cinch," he said, "we just steal it."

We had by now learned to walk backward, so that we could move along the streets without exciting too much comment. Visualize this, and you will see that a man walking backward from 12:00 to 11:55 looks like a man walking forward from 11:55 to 12:00.

Visualize it further: A man moving in this wise who enters a store empty-handed at 12:00 and leaves loaded with food at 11:50 looks like a normal man who comes in with a full shopping bag at 11:50 and

leaves without it at 12:00—a peculiar procedure, but not one to raise a cry of "Stop thief!"

My conscience rebelled, but necessity is proverbially not cognizant of laws. So we could live. We could have whatever we wanted, so long as we kept it on our persons. There was a period when Givens ran amok with this power. He plundered the city. For a time he possessed an untold fortune in banknotes and gold and precious gems. But their weight tired him in the end; crime has no zest when it is neither punishable nor profitable.

Work was impossible. I tried to do the necessary research and experiment to reverse our courses, but nothing could be achieved when all inanimate objects departed on another time stream as soon as I ceased to hold them. I could read, and did read inordinately, plundering libraries as eagerly as food stores. Sometimes I thought I saw a glimmering of hope, but it was the false daylight at the mouth of an endless and self-extending tunnel.

I missed music, although after some twenty years I did succeed in cultivating a taste for the unthinkable progressions of music heard in reverse. Givens, I think, missed knavery; at last the world was giving him gratis the living which it owed him, and he was bored.

So we took to travel—which was accomplished, of course, by climbing backward onto a boat or train at its destination and traveling back with it to its origin. In strange foreign lands the strangeness of reversal is less marked. And a magnificent mountain, a glinting glacier is free from time.

The best part of travel was waterfalls—perhaps the one advantage of our perverse state. You cannot conceive the awesome stateliness of a river leaping hundreds of meters in the air. We even made a special trip to British Guiana to see Kukuenaam; and beholding it, I felt almost reconciled to my life.

I was most tormented when I despairingly abandoned my scientific research and took to reading novels. Human relationships, which had seemed so unnecessary to my self-absorbed title, now loomed all-significant. I wanted companionship, friendship, perhaps even love, as I had never wanted fame and glory.

And what did I have? Givens.

The only man with whom I could communicate in all the universe.

We tried separation occasionally, but never without appointing a meeting place and time for which we were always both early. Loneliness is a terrible thing, as no one else of my race can fully know.

We were inseparable. We needed each other. And we hated each other.

I hated Givens for his banal humor, his cheap self-interest.



He hated me for my intellect, my pride. And each laid on the other the blame for our present fate.

And so, a few days ago, I realized that Givens was planning to kill me. In a way, I think it was not so much from hatred of me as because he had missed for thirty years the petty conniving of his old life and now at last saw that a grand crime was possible for him.

He thought that he was hiding it from me. Of course he could not. I knew every bulge of the possessions that he wore, and easily recognized the revolver when he stole it and added it to his gear.

We were in Los Angeles because I had come to look at myself. I found an odd pleasure in doing that occasionally, as you will have realized from my "ghosts," a bitter sort of joy. So now I stood in the Queen of the Angels Hospital peering through glass at my red-faced yowling two-day old self. A nurse smiled at me with recognition, and I saw she thought I was Gramps. There, looking at my beginning life, I resolved to save my life, however tortured and reversed it was.

We were then living in the room you know on West Adams. For some time we had developed the technique of watching for people moving into a place. After that—before, from the normal viewpoint—the place is untenanted and safe for our abode for a while.

I returned to the room to find Tim Givens' body on the bed. Then I knew that death had the power to stop our wanderings, that the dead body resumed its normal movement in time. And I knew what else I must do.

The rest of that scene you know. How I took your card, gave your official-looking friend my confession, and backed out—when you thought me entering.

When I next visited the room, Givens was there alive. It was surprisingly simple. Underestimating me in practical matters, he was not on his guard. I secured the revolver with no trouble. Just before I pressed the trigger—for the bullet, free from my field, moved for a moment in normal time—I saw the bullet strike.

I pressed hard, and gave him release.

Now I seek it for myself. Only death can end this Odyssey, this voyage of loneliness and pain compared to which *The Flying Dutchman* sailed on a luxury cruise.

And when this manuscript is typed, I shall swallow the cyanide I stole yesterday.

This manuscript must reach the World Institute for Paranormal Research. They will find my notes in my laboratory. They must know that those who foretold danger were right, that my method must not be used again save with serious revision.

And yet this cannot reach them before the experiment; for they would stop me and I was not stopped. Seal it, then. Place it in the hands of some trustworthy institution. And inscribe on it:

To be delivered to the World Institute for Paranormal Research, Basle, Switzerland, F. E. D., February 3, 1971.

Perhaps the name of Hull may yet not be forgotten.

Fergus O'Brien swore comprehensively for a matter of minutes. "The egotist! The lowdown egocentric idiot! Think what he could have told us: How the war came out, how the peace was settled, how atomic power was finally developed!—And what does he give us? Nothing that doesn't touch him."

"I wish that's all I had to worry about," said Detective lieutenant A. Jackson morosely.

"There are hints, of course. Obviously a United Nations victory or he wouldn't have been living in such a free world in 1971. And that F. E. D. in the address—

"What would that mean?"

"Maybe Federated European Democracies—I hope. But at least we've learned a wonderful new word. Chronokinesis—" He savored it.

Jackson rose gloomily. "And I've got to get down to the office and try to write a report on this. I'll take this manuscript—"

"Uh uh. This was given me in trust, Andy. And somehow it's going to get to the WIRP on the appointed date."

"O.K. I'm just as glad. If the inspector saw *that* in the files— Want to come down with me and see what we can cook up?"

"Thanks no, Andy. I'm headed for the Queen of the Angels."

"The hospital? Why?"

"Because," Fergus grinned, "I want to see what a two-day-old murderer looks like."

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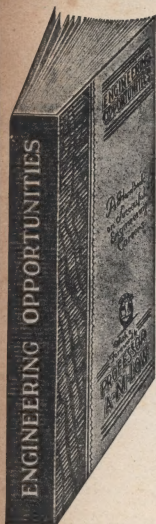
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